Panasonic

ORDER NO. DSC0602007CE

B26

# Service Manual

## Digital Camera

**DMC-LS2PP**
**DMC-LS2PL**
**DMC-LS2EB**
**DMC-LS2EE**
**DMC-LS2EF**
**DMC-LS2EG**
**DMC-LS2EGM**
**DMC-LS2GC**
**DMC-LS2GK**
**DMC-LS2GN**
**DMC-LS2GT**
**DMC-LS2SG**
**DMC-LS3EF**
**DMC-LS3EG**
**DMC-LS3EGM**

**Colour**
**Vol. 1**
**(S).....Silver Type**

LUMIX

**⚠ WARNING**

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

# 1 Safety Precaution

## 1.1 General Guidelines

1. **IMPORTANT SAFETY NOTICE**
   There are special components used in this equipment which are important for safety. These parts are marked by ⚠ in the Schematic Diagrams, Circuit Board Layout, Exploded Views and Replacement Parts List. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent X-RADIATION, shock, fire, or other hazards. Do not modify the original design without permission of manufacturer.

2. An Isolation Transformer should always be used during the servicing of AC Adaptor whose chassis is not isolated from the AC power line. Use a transformer of adequate power rating as this protects the technician from accidents resulting in personal injury from electrical shocks. It will also protect AC Adaptor from being damaged by accidental shorting that may occur during servicing.

3. When servicing, observe the original lead dress. If a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.
4. After servicing, see to it that all the protective devices such as insulation barriers, insulation papers shields are properly installed.
5. After servicing, make the following leakage current checks to prevent the customer from being exposed to shock hazards.

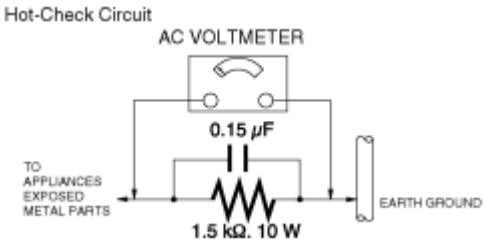
## 1.2 Leakage Current Cold Check

1. Unplug the AC cord and connect a jumper between the two prongs on the plug.
2. Measure the resistance value, with an ohmmeter, between the jumpered AC plug and each exposed metallic cabinet part on the equipment such as screwheads, connectors, control shafts, etc. When the exposed metallic part has a return path to the chassis, the reading should be between 1 MΩ and 5.2 MΩ. When the exposed metal does not have a return path to the chassis, the reading must be infinity.

## 1.3 Leakage Current Hot Check (See Figure 1.)

1. Plug the AC cord directly into the AC outlet. Do not use an isolation transformer for this check.
2. Connect a 1.5 kΩ, 10 W resistor, in parallel with a 0.15 µF capacitor, between each exposed metallic part on the set and a good earth ground, as shown in Figure 1.
3. Use an AC voltmeter, with 1 kΩ/V or more sensitivity, to measure the potential across the resistor.
4. Check each exposed metallic part, and measure the voltage at each point.
5. Reverse the AC plug in the AC outlet and repeat each of the above measurements.
6. The potential at any point should not exceed 0.75 V RMS. A leakage current tester (Simpson Model 229 or equivalent) may be used to make the hot checks, leakage current must not exceed 1/2 mA. In case a measurement is outside of the limits specified, there is a possibility of a shock hazard, and the equipment should be repaired and rechecked before it is returned to the customer.

**Figure. 1**




## 1.4 How to Discharge the Capacitor on Main PCB

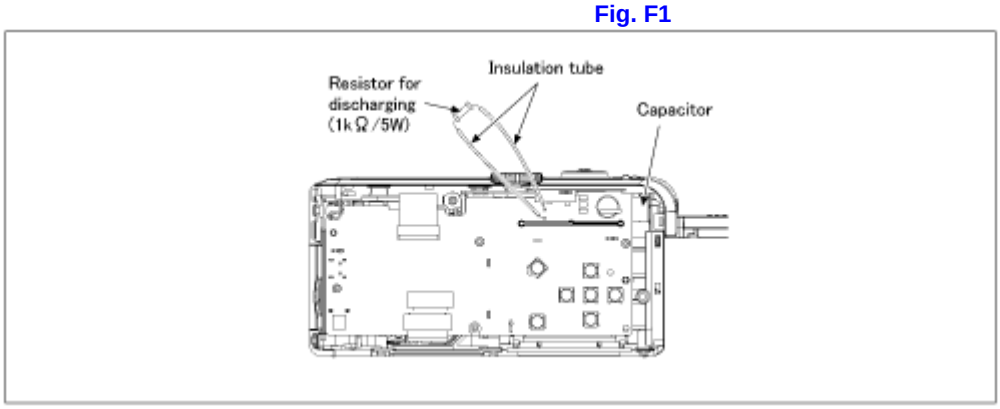
**CAUTION:**

1. **Be sure to discharge the capacitor on MAIN PCB.**
2. **Be careful of the high voltage circuit on MAIN PCB when servicing.**

**[Discharging Procedure]**

1. Refer to the disassemble procedure and Remove the necessary parts/unit.
2. Put the insulation tube onto the lead part of Resistor (ERG5SJ102:1kΩ /5W).
   (an equivalent type of resistor may be used.)
3. Put the resistor between both terminals of capacitor on MAIN PCB for approx. 5 seconds.
4. After discharging confirm that the capacitor voltage is lower than 10V using a voltmeter.

**Fig. F1**



# 2 Warning

## 2.1 Prevention of Electro Static Discharge (ESD) to Electrostatically Sensitive (ES) Devices

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices.

Examples of typical ES devices are CCD image sensor, IC (integrated circuits) and some field-effect transistors and semiconductor "chip" components.

The following techniques should be used to help reduce the incidence of component damage caused by electro static discharge (ESD).

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any ESD on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging ESD wrist strap, which should be removed for potential shock reasons prior to applying power to the unit under test.

2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an antistatic solder removal device. Some solder removal devices not classified as "antistatic (ESD protected)" can generate electrical charge sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).

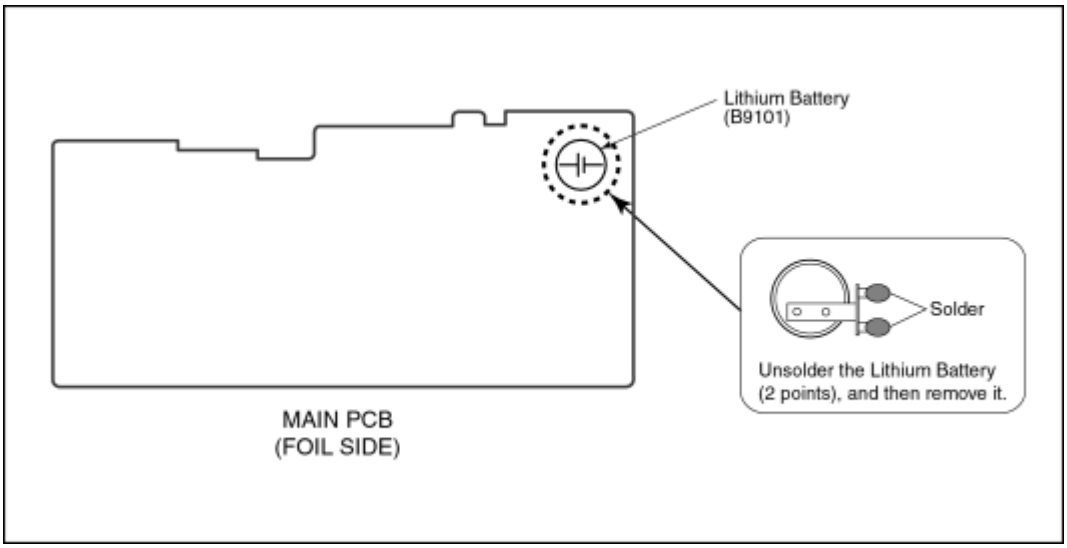
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

   **CAUTION :**
   Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity (ESD) sufficient to damage an ES device).

## 2.2 How to Replace the Lithium Battery

### 2.2.1 Replacement Procedure

1. Remove the Main PCB (Refer to Disassembly Procedures.)
2. Remove the Lithium battery (Ref. No. "B9101" at foil side of Main PCB) and then replace it into new one.




**NOTE:**

This Lithium battery is a critical component.

(Type No.: ML-614S/F9FE **Manufactured by Matsushita Battery Industrial Co.,Ltd.** )

It must never be subjected to excessive heat or discharge.

It must therefore only be fitted in requirement designed specifically for its use.

Replacement batteries must be of same type and manufacture.

They must be fitted in the same manner and location as the original battery, with the correct polarity contacts observed.

Do not attempt to re-charge the old battery or re-use it for any other purpose.

It should be disposed of in waste products destined for burial rather than incineration.

**(For English)**

**CAUTION**

Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type recommended by the manufacturer.
Dispose of used batteries according to the manufacturer's instructions.

**(For French)**

**PRECAUTION**

Le fait de remplacer incorrectement la pile peut présenter des risques d'explosion.
Remplacer la pile uniquement par une pile identique ou de type équivalent recommandée par le fabricant. Se débarrasser des piles usagées conformément aux instructions du fabricant.

**(For German)**

**VORSICHT**

Bei einer falsch eingesetzten Batterie besteht Explosionsgefahr. Nur mit einer vom Hersteller empfohlenen Batterie vom gleichen Typ ersetzen.
Verbrauchte Battrien beim Fachhändler oder einer Sammelstelle für Sonderstoffe abliefern.

**(For Swedish)**

**VARNING**

Explosionsfara vid felaktigt batteribyte.
Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattilverkaren.
Kassera använt batteri enligt fabrikantens instruktion.

**(For Norwegian)**

**ADVARSEL!**

Lithiumbatteri-Eksplosionsfare ved fejlagtig håndtering.
Udskiftning má kun ske med batteri af samme fabrikat og type.
Levér det brugte batteri tibage til leverandøren.

**(For Finnish)**

**VAROITUS**

Paristo voi räjähtää, jos se on virheellisesti asennettu.
Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin.
Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

**NOTE:**

Above caution are also applicable for below batteries which is for DMC-LS2/LS3 all series, as well.

1. AA Oxyride batteries
2. AA Alkaline batteries
3. AA Rechargeable Ni-MH (nickel-metal hydride) batteries

# 3 Service Navigation

## 3.1 Introduction

This service manual contains technical information, which allow service personnel's to understand and service this model.

Please place orders using the parts list and not the drawing reference numbers.

If the circuit is changed or modified, the information will be followed by service manual to be controlled with original service manual.

## 3.2 General Description About Lead Free Solder (PbF)

The lead free solder has been used in the mounting process of all electrical components on the printed circuit boards used for this equipment in considering the globally environmental conservation.

The normal solder is the alloy of tin (Sn) and lead (Pb). On the other hand, the lead free solder is the alloy mainly consists of tin (Sn), silver (Ag) and Copper (Cu), and the melting point of the lead free solder is higher approx.30°C (86° F) more than that of the normal solder.

**Distinction of PCB Lead Free Solder being used**

| | |
|---|---|
| The letter of "PbF" is printed either foil side or components side on the PCB using the lead free solder.(See right figure) | PbF |

**Service caution for repair work using Lead Free Solder (PbF)**

- The lead free solder has to be used when repairing the equipment for which the lead free solder is used. (Definition: The letter of "PbF" is printed on the PCB using the lead free solder.)
- To put lead free solder, it should be well molten and mixed with the original lead free solder.
- Remove the remaining lead free solder on the PCB cleanly for soldering of the new IC.
- Since the melting point of the lead free solder is higher than that of the normal lead solder, it takes the longer time to melt the lead free solder.
- Use the soldering iron (more than 70W) equipped with the temperature control after setting the temperature at 350±30°C (662±86°F).

**Recommended Lead Free Solder (Service Parts Route.)**

- The following 3 types of lead free solder are available through the service parts route.
  RFKZ03D01K----------(0.3mm 100g Reel)
  RFKZ06D01K----------(0.6mm 100g Reel)
  RFKZ10D01K----------(1.0mm 100g Reel)

**Note**

* Ingredient: tin (Sn) 96.5%, silver (Ag) 3.0%, Copper (Cu) 0.5%, Cobalt (Co) / Germanium (Ge) 0.1 to 0.3%

## 3.3 Important Notice 1:(Other than U.S.A. and Canadian Market)

1. The service manual does not contain the following information, because of the impossibility of servicing at component level without concerned equipment/facilites.
   1. Schematic diagram, Block Diagram and PCB layout of Main PCB.
   2. Parts list for individual parts of Main PCB.

   When a part replacement is required for repairing Main PCB, replace as an assembled parts. (Main PCB)
2. The following category is/are recycle module part. please send it/them to Central Repair Center.
   - MAIN PCB (VEP56027A) : Excluding replacement of Lithium Battery

## 3.4 How to Define the Model Suffix (NTSC or PAL

# model)

There are six kinds of DMC-LS2/LS3, regardless of the colours.

- a) DMC-LS2S
- b) DMC-LS2PP
- c) DMC-LS2EB/EF/EG/EGM/GN, LS3EF/EG/EGM
- d) DMC-LS2EE
- e) DMC-LS2GT
- f) DMC-LS2PL/GC/GK/SG

(DMC-LS2S is exclusively Japan domestic model.)
What is the difference is that the “INITIAL SETTINGS” data which is stored in Flash ROM mounted on Main PCB.

## 3.4.1 Defining methods:

To define the model suffix to be serviced, refer to the nameplate which is putted on the bottom side of the Unit.

**a) DMC-LS2S**
DMC-LS2S is exclusively Japan domestic model.

**b) DMC-LS2PP**
The nameplate for this model show the following Safty registration mark.

**c) DMC-LS2EB/EF/EG/EGM/GN, LS3EF/EG/EGM**
The nameplate for these models show the following Safty registration mark.

**d) DMC-LS2EE**
The nameplate for this model show the following Safty registration mark.

**e) DMC-LS2GT**
The nameplate for this model show the following Safty registration mark.

D31221

**f) DMC-LS2PL/GC/GK/SG**
The nameplate for these models do not show any above Safty registration mark.


**NOTE:**
After replacing the MAIN PCB, be sure to achieve adjustment.
The adjustment instruction is available at “software download” on the “Support Information from NWBG/VDBG-PAVC” web-site in “TSN system”, together with Maintenance software.

## 3.4.2 INITIAL SETTINGS:

**CAUTION:**
The unit employs "Built-in Memory" for picture image data recording. (Approx.14MB)
Be sure to make picture data back up (i.e., Copying to SD memory card), before proceeding "INITIAL SETTINGS".
Once "INITIAL SETTINGS" has been carried out, all image data belong to "Built-in Memory" shall be erased.

**CAUTION:**
NEVER select “NONE(JAPAN)” if the unit is other than “JAPAN” model.
Other-wise, it can not be reset to the others.

When you replace the Main PCB be sure to perform the initial settings after achieving the Adjustment, by ordering the following procedure in accordance with model suffix.

- **Step 1. The temporary cancellation of factory setting:**
  Set the mode dial to “ [ Normal picture mode ] (Red camera mark)”.
  While keep pressing [ Optical Image Stabilizer ] and “[ UP ] of Cross key” simultaneously, turn the Power on.
- **Step 2. The cancellation of factory setting:**

Set the mode dial to “[ Playback ]”.

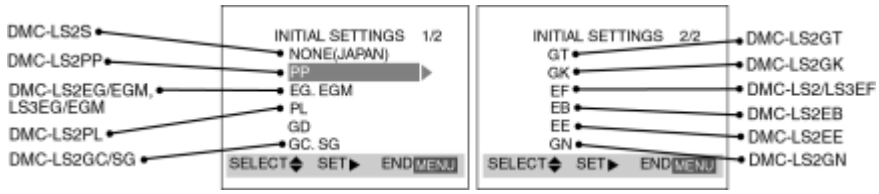
Press [ Optical Image Stabilizer ] and “[ UP ] of Cross key” simultaneously, then turn the Power off.

- **Step 3. Turn the Power on:**

  Set the mode dial to “ [ Normal picture mode ] (Red camera mark)”, and then turn the Power on.

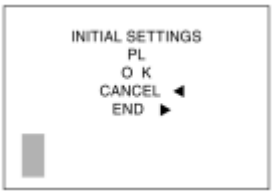
- **Step 4. Display the INITIAL SETTING:**

  While keep pressing [ MENU ] and “[ RIGHT ] of Cross key” simultaneously, turn the Power off.




- **Step 5. Set the INITIAL SETTING:**

  Select the area with pressing “[ UP ] / [ DOWN ] of Cross key”, and then press the “[ RIGHT ] of Cross key”.




  The only set area is displayed, and then press the “[ RIGHT ] of Cross key” after confirmation.
  (The unit is powered off automatically.)

  Confirm the display of “PLEASE SET THE CLOCK” in English when the unit is turned on again.

- **Step 6. CONFIRMATION:**

  The display shows “PLEASE SET THE CLOCK” when turn the Power on again.

  When the unit is connected to PC with USB cable, it is detected as removable media.

  (When the “GT” or “GK” model suffix is selected, the display shows “PLEASE SET THE CLOCK” in Chinese.)

1) As for your reference Default setting condition is given in the following table.

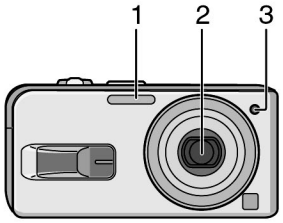
- **Default setting (After “INITIAL SETTINGS”)**

| | MODEL | VIDEO OUTPUT | LANGUAGE | DATE | REMARKS |
|---|---|---|---|---|---|
| a) | DMC-LS2S | NTSC | Japanese | Year/Month/Date | |
| b) | DMC-LS2PP | NTSC | English | Month/Date/Year | |
| c) | DMC-LS2EB/EE/EF/EG/EGM/GC/GN, DMC-LS3EF/EG/EGM | PAL | English | Date/Month/Year | |
| d) | DMC-LS2GK | PAL | Chinese (simplified) | Year/Month/Date | |
| e) | DMC-LS2GT | NTSC | Chinese (traditional) | Year/Month/Date | |

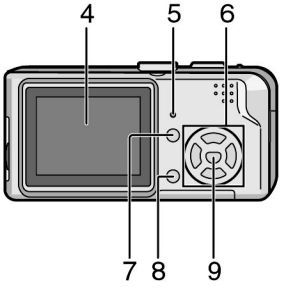
# 4 Specifications

| | |
|---|---|
| **Digital Camera:** | Information for your safety |
| **Power Source:** | DC 3.0 V |
| **Power Consumption:** | 1.4 W (When recording)<br>0.7 W (When playing back) |
| **Camera effective pixels:** | 5,000,000 pixels |
| **Image sensor:** | 1/2.5" CCD, total pixel number 5,360,000 pixels,<br>Primary color filter |
| **Lens:** | Optical 3× zoom, f=5.8 mm to 17.4 mm (35 mm film camera equivalent: 35 mm to 105 mm)/F2.8 to F5.0 |
| **Digital zoom:** | Max. 4× |
| **Extended optical zoom:** | Max. 3.8× (Except for the maximum picture size for each aspect ratio) |
| **Focus:** | Normal/Macro, 5-area-focusing/3-area-focusing (High speed)/1-area-focusing (High speed)/1-area-focusing/Spot-focusing |
| **Focus range:** | Normal: 50 cm (1.64 feet) to ∞<br>Macro/Simple/Motion picture: 5 cm (0.16 feet) (Wide)/30 cm (0.98 feet) (Tele) to ∞ |
| **Shutter system:** | Electronic shutter+Mechanical shutter |
| **Burst recording** | |
| **Burst speed:** | 3 frames/second (High speed), 2 frames/second (Low speed), Approx. 1.5 frames/second (Unlimited) |
| **Number of recordable pictures:** | Max. 5 frames (Standard), max. 3 frames (Fine), Depends on the remaining capacity of the built-in memory or the card (Unlimited).<br>(Performance in burst recording is only with SD Memory Card. MultiMediaCard performance will be less.) |
| **Motion picture recording:** | 320×240 pixels (30 or 10 frames/second without audio. The maximum recording time depends on the capacity of the built-in memory or the card.) |
| **ISO sensitivity:** | AUTO/80/100/200/400 |
| **Shutter speed:** | 8 to 1/2000th<br>[STARRY SKY] mode: 15 seconds, 30 seconds, 60 seconds<br>Motion picture mode: 1/30th to 1/4000th |
| **White balance:** | AUTO/Daylight/Cloudy/Halogen/White set |
| **Exposure (AE):** | Program AE<br>Exposure compensation (1/3 EV Step, −2 EV to +2 EV) |
| **Metering mode:** | Multiple |
| **LCD monitor:** | 2.0" TFT LCD (Approx. 86,000 pixels) (field of view ratio about 100%) |
| **Flash:** | Flash range: (ISO AUTO)<br>Approx. 30 cm (0.98 feet) to 3.7 m (12.1 feet) (Wide)<br>AUTO, AUTO/Red-eye reduction, Forced ON (Forced ON/Red-eye reduction), Slow sync./Red-eye reduction, Forced OFF |
| **Recording media:** | Built-in Memory (Approx. 14 MB)/SD Memory Card/MultiMediaCard (Still pictures only) |
| **Picture size** | |
| **Still picture:** | When the aspect ratio setting is [4:3]<br>2560×1920 pixels, 2048×1536 pixels, 1600×1200 pixels, 1280×960 pixels, 640×480 pixels<br>When the aspect ratio setting is [3:2]<br>2560×1712 pixels, 2048×1360 pixels<br>When the aspect ratio setting is [16:9]<br>2560×1440 pixels, 1920×1080 pixels |
| **Motion pictures:** | 320×240 pixels |
| **Quality:** | Fine/Standard |
| **Recording file format** | |
| **Still Picture:** | JPEG (based on Design rule for Camera File system, based on Exif 2.2 standard)/DPOF corresponding |
| **Motion pictures:** | QuickTime Motion JPEG (Motion pictures without audio) |
| **Interface** | |
| **Digital:** | USB 2.0 (Full Speed) |
| **Analog video:** | NTSC/PAL Composite (Switched by menu) |
| **Terminal** | |
| **DIGITAL/V.OUT:** | Dedicated jack (8 pin) |
| **DC IN:** | Type 1 jack |
| **Dimensions:** | Approx. 110.5 mm (W)×53.5 mm (H)×30.9 mm (D) [4 3/8" (W)×2 1/8" (H)×1 3/16" (D)] (excluding the projection part) |
| **Mass:** | Approx. 138 g/4.87 oz (excluding card and batteries), Approx. 186 g/6.56 oz (with card and batteries) |
| **Operating temperature:** | 0 °C to 40 °C (32 °F to 104 °F) |
| **Operating humidity:** | 10% to 80% |

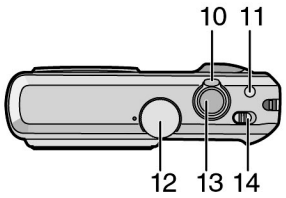
# Names of the Components



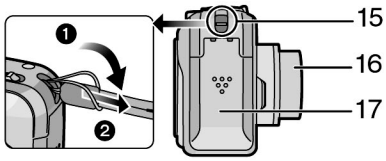

1 Flash
2 Lens
3 Self-timer indicator



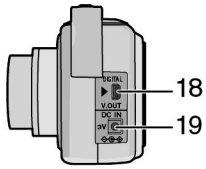

4 LCD monitor
5 Status indicator
6 Cursor buttons
◄/Self-timer button
▼/[REV] button
►/Flash setting button
▲/Exposure compensation/Auto bracket /White balance fine adjustment /Backlight compensation in simple mode button
7 [DISPLAY] /[HIGH ANGLE] button
8 Delete/Single or burst mode button
9 [MENU/SET] button



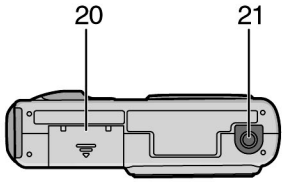

10 Zoom lever
11 Optical image stabilizer button
12 Mode dial
13 Shutter button
14 Camera ON/OFF switch




15 Strap eyelet
16 Lens barrel
17 Battery door



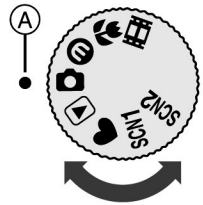

18 [DIGITAL/V.OUT] socket
19 [DC IN] socket
• Always use a genuine Panasonic AC adaptor (DMW-AC6; optional).




20 Card door
21 Tripod receptacle
• When you use a tripod, make sure it is stable when the camera is attached to it.

# About The Mode Dial

Adjust part Ⓐ to the desired mode.
The mode dial can be rotated 360°. Rotate it slowly and surely to adjust to each mode. (Do not adjust it to parts where there is no mode.)




**: Normal picture mode**
Use this mode for normal recording.

**: Economy mode**
This mode allows you to take pictures while reducing battery power consumption.

**: Macro mode**
This mode allows you to take a close-up picture of a subject.

**: Motion picture mode**
This mode allows you to record motion pictures.

**SCN1: Scene mode 1**
**SCN2: Scene mode 2**
This mode allows you to match the picture to the scene being recorded.
Two frequently used scenes can be set to the mode dials [SCN1] and [SCN2].

**: Simple mode**
This mode is recommended for beginners.

**: Playback mode**
This mode allows you to play back recorded pictures.

# 6 Service Mode

## 6.1 Error Code Memory Function

1. **General description**

   This unit is equipped with history of error code memory function, and can be memorized 32 error codes in sequence from the latest. When the error is occurred more than 32, the oldest error is overwritten in sequence.

   The error code is not memorized when the power supply is shut down forcibly (when the unit is powered on by the battery, the battery is pulled out) because the error code is memorized to FLASH ROM when the unit is powered off.

2. **How to display**

   The error code can be displayed by the following procedure:

   Before perform the error code memory function, connect the AC adaptor or insert the battery, and insert the SD card.

   - **1. The temporary cancellation of factory setting:**

     Set the mode dial to " [ Normal picture mode ] (Red camera mark)".

     While keep pressing [ Optical Image Stabilizer Button ] and "[ UP ] of Cross key" simultaneously, turn the Power on.

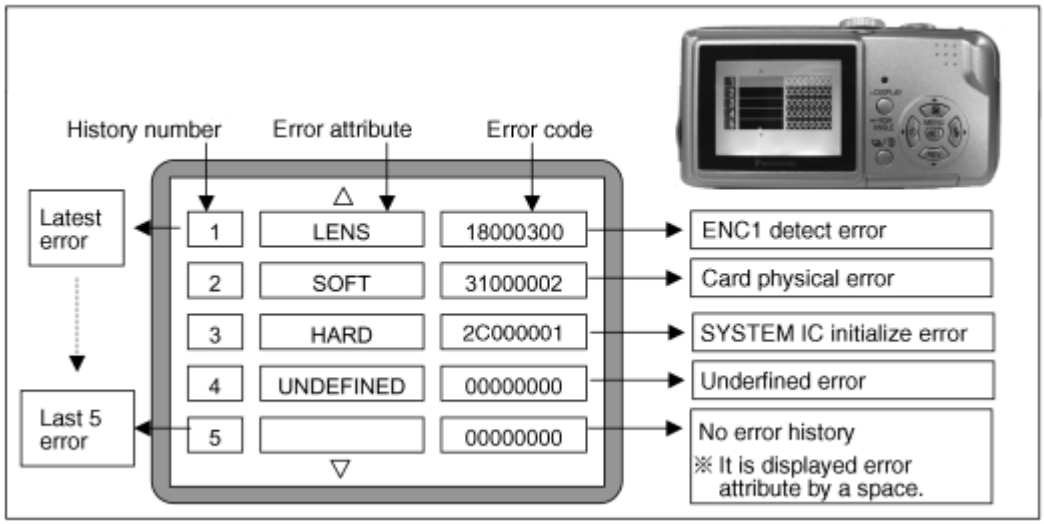
   - **2. The display of error code:**

     Press [ Optical Image Stabilizer Button ], [ MENU ] and "[ LEFT ] of Cross key" simultaneously with the step 1 condition.

     The display is changed as shown below when the above buttons is pressed simultaneously.

     Normal display → Error code display → Operation history display → Normal display → .....

     **Example of Error Code Display**




   - **3. The change of display:**

     The error code can be memorized 32 error codes in sequence, however it is displayed 5 errors on the LCD.

     Display can be changed by the following procedure:

     "[ UP ] or [ DOWN ] of Cross key" : It can be scroll up or down one.

     "[ LEFT ] or [ RIGHT ] of Cross key" : It can be display last 5 error or another 5 error.

   - **4. How to read the error code:**

     One error code is displayed for 8 bit, the contents of error codes is indicated the table as shown below.

| | | | | |
|---|---|---|---|---|
| | | | | |

| Attribute | Main item | Sub item | Error code | | Contents (Upper) |
|---|---|---|---|---|---|
| | | | High 4 bits | Low 4 bits | Check point (Lower) |
| LENS | Lens drive | OIS | 1800 | 1000 | PSD (X) error. Hall element (X axis) position detect error in OIS unit. |
| | | | | | OIS Unit |
| | | | | 2000 | PSD (Y) error. Hall element (Y axis) position detect error in OIS unit. |
| | | | | | OIS Unit |
| | | | | 3000 | GYRO (X) error. Gyro (IC7102: X axis) detect error on Main P.C.B.. |
| | | | | | IC7102 (Gyro element) or IC6001 (VENUS PLUS) |
| | | | | 4000 | GYRO (Y) error. Gyro (IC7101: Y axis) detect error on Main P.C.B.. |
| | | | | | IC7101 (Gyro element) or IC6001 (VENUS PLUS) |
| | | | | 5000 | MREF error (Reference voltage error). |
| | | | | | IC7002 (LENS drive) or IC6001 (VENUS PLUS) |
| | | | | 6000 | Drive voltage (X) error. |
| | | | | | VENUS PLUS AD value error, LENS Unit, LENS flex breaks etc. |
| | | | | 7000 | Drive voltage (Y) error. |
| | | | | | VENUS PLUS AD value error, LENS Unit, LENS flex breaks etc. |
| | | C.B./Zoom | | 0100 | HP Low detect error (C.B. encoder (full retract) always Low detect). |
| | | | | | FP9001-(2, 10) signal line or IC6001 (VENUS PLUS) |
| | | | | 0200 | HP High detect error (C.B. encoder (full retract) always High detect). |
| | | | | | FP9001-(2, 10) signal line or IC6001 (VENUS PLUS) |
| | | | | 0300 | ENC1 detect error (C.B. motor encoder detect error). |
| | | | | | FP9001-(2) signal line or IC6001 (VENUS PLUS) |
| | | | | 0400 | ENC2 detect error (C.B. motor encoder detect error). |
| | | | | | FP9001-(10) signal line or IC6001 (VENUS PLUS) |
| | | Zoom | | 0010 | HP Low detect error (Zoom encoder always Low detect error). |
| | | | | 0020 | HP High detect error (Zoom encoder always High detect error). |
| | | | | 0030 | ENC1 detect error (Zoom encoder detect error). |
| | | | | 0040 | ENC2 detect error (Zoom encoder detect error). |
| | | Focus | | 0001 | HP Low detect error (Focus encoder always Low detect error). |
| | | | | | FP9001-(27) signal line or IC6001 (VENUS PLUS) |
| | | | | 0002 | HP High detect error (Focus encoder always High detect error). |
| | | | | | FP9001-(27) signal line or IC6001 (VENUS PLUS) |
| | | Lens | 1801 | 0000 | Power ON time out error. |
| | | | | | Lens drive system |
| | | | 1802 | 0000 | Power OFF time out error. |
| | | | | | Lens drive system |
| | Adj.History | OIS | 1900 | 2000 | OIS adj. Yaw direction amplitude error (small) |
| | | | | 3000 | OIS adj. Pitch direction amplitude error (small) |
| | | | | 4000 | OIS adj. Yaw direction amplitude error (large) |
| | | | | 5000 | OIS adj. Pitch direction amplitude error (large) |
| | | | | 6000 | OIS adj. MREF error |
| | | | | 7000 | OIS adj. time out error |
| | | | | 8000 | OIS adj. Yaw direction off set error |
| | | | | 9000 | OIS adj. Pitch direction off set error |
| | | | | A000 | OIS adj. Yaw direction gain error |
| | | | | B000 | OIS adj. Pitch direction gain error |
| | | | | C000 | OIS adj. Yaw direction position sensor error |
| | | | | D000 | OIS adj. Pitch direction position sensor error |

| | | | | | |
|---|---|---|---|---|---|
| | | | | E000 | OIS adj. other error |
| HARD | FLASH ROM (EEPROM Area) | FLASH ROM (EEPROM Area) | 2B00 | 0001 | EEPROM read error |
| | | | | | IC6002 (FLASH ROM) |
| | | | | 0002 | EEPROM write error |
| | | | | | IC6002 (FLASH ROM) |
| | SYSTEM | RTC | 2C00 | 0001 | SYSTEM IC initialize error |
| | | | | | Communication between IC6001 (VENUS PLUS) and IC9101 (SYSTEM) |
| SOFT | CPU | Reset | 3000 | 0001 \| 0007 | NMI reset<br>Non Mask-able Interrupt<br>(30000001-30000007 are caused by factors) |
| | Card | Card | 3100 | 0001 | Card logic error |
| | | | | | SD card data line or IC6001 (VENUS PLUS) |
| | | | | 0002 | Card physical error |
| | | | | | SD card data line or IC6001 (VENUS PLUS) |
| | | | | 0004 | Write error |
| | | | | | SD card data line or IC6001 (VENUS PLUS) |
| | | | 3900 | 0005 | Format error |
| | CPU, ASIC hard | Stop | 3800 | 0001 | Camera task finish process time out. |
| | | | | | Communication between Lens system and IC6001 (VENUS PLUS) |
| | | | | 0002 | Camera task invalid code error. |
| | | | | | IC6001 (VENUS PLUS) |
| | | | | 0100 | File time out error in recording motion image |
| | | | | | IC6001 (VENUS PLUS) |
| | | | | 0200 | File data send error in recording motion image |
| | | | | | IC6001 (VENUS PLUS) |
| | Operation | Power on | 3B00 | 0000 | FLASHROM processing early period of camera during movement. |
| | Zoom | Zoom | 3C00 | 0000 | I do not complete zoom lens processing |
| | | | | | Zoom lens |
| | | | 3500 | 0000 | I jumped into dummy processing |
| | | | | | (0-7bit : command, 8-15bit : Status) |
| | | | 3501 | 0000 | Though record preprocessing is necessary, it is not called. |
| | | | 3502 | 0000 | Though record preprocessing is necessary, it is not completed. |

- **5. How to returned to Normal Display:**
  Turn the power off and on, to exit from Error code display mode.

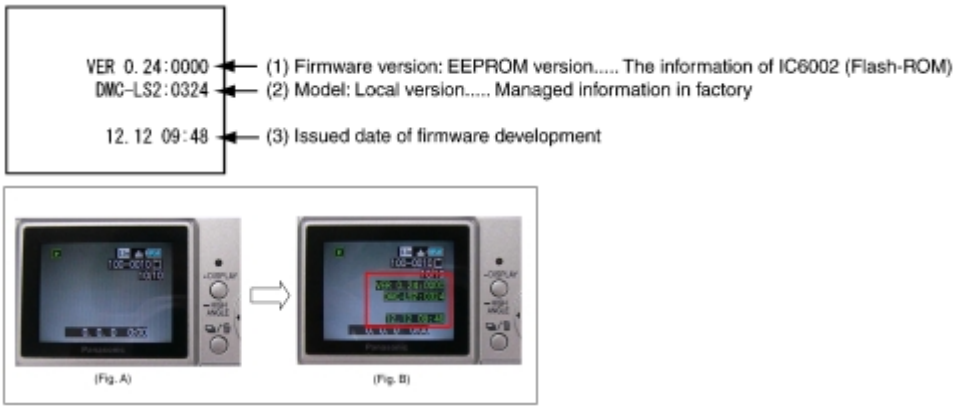
  **NOTE:**
  The error code can not be initialized.

# 6.2 Confirmation of Firmware Version

The Firmware version can be confirmed by ordering the following steps:.

- **Step 1. The temporary cancellation of factory setting:**
  Set the mode dial to “[ Normal picture mode ] (Red camera mark)”.
  Insert the SD memory card which has a few photo data.
  While keep pressing [ Optical Image Stabilizer ] and “[ UP ] of Cross key” simultaneously, then turn the power on.
- **Step 2. Confirm the version:**
  Set the mode dial to “[ Playback ]” and then press [ DISPLAY ] to switch to LCD with indication. (Fig. A)
  Press [ Optical Image Stabilizer ] and “[ DOWN ] of Cross key” simultaneously. (No need to keep pressing.)
  (The version information is displayed on the LCD with green colour letters.) (Fig. B)

**CAUTION:**
The version information does not display if the LCD has switched to LCD with indication already.
In this case, press [ DISPLAY ] to switch to LCD with indication.

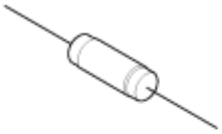
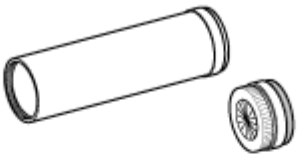
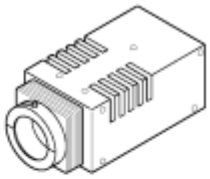
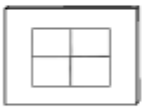



- The firmware version and EEPROM version can be confirmed with the information (1).
- The information (2), (3) are just reference.

# 7 Service Fixture & Tools

## 7.1 Service Fixture and Tools

The following Service Fixture and tools are used for checking and servicing this unit.

| | | |
|---|---|---|
| Resistor for Discharging<br>ERG5SJ102 | Infinity Lens (with Focus Chart)<br>VFK1164TCM02 | LIGHT BOX<br>VFK1164TDVLB |
|  <br>An equivalent type of Resistor may be used. |  |  <br>※ with DC Cable |
| TR Chart<br>VFK1975 | Lens Cleaning Kit (BK)<br>VFK1900BK | Grease (for lens)<br>VFK1829 |
|  |  <br>* Only supplied as 10 set/box. |  |
| Furoyl grease (for focus motor)<br>VFK1850 | T3 Trox Driver<br>RFKZ0334 | ND Filter<br>ND0.1 Type VFK1164ND01 |
|  |  |  <br>An equivalent type of Filter may be used. |

## 7.2 When Replacing the Main PCB

After replacing the MAIN PCB, be sure to achieve adjustment.

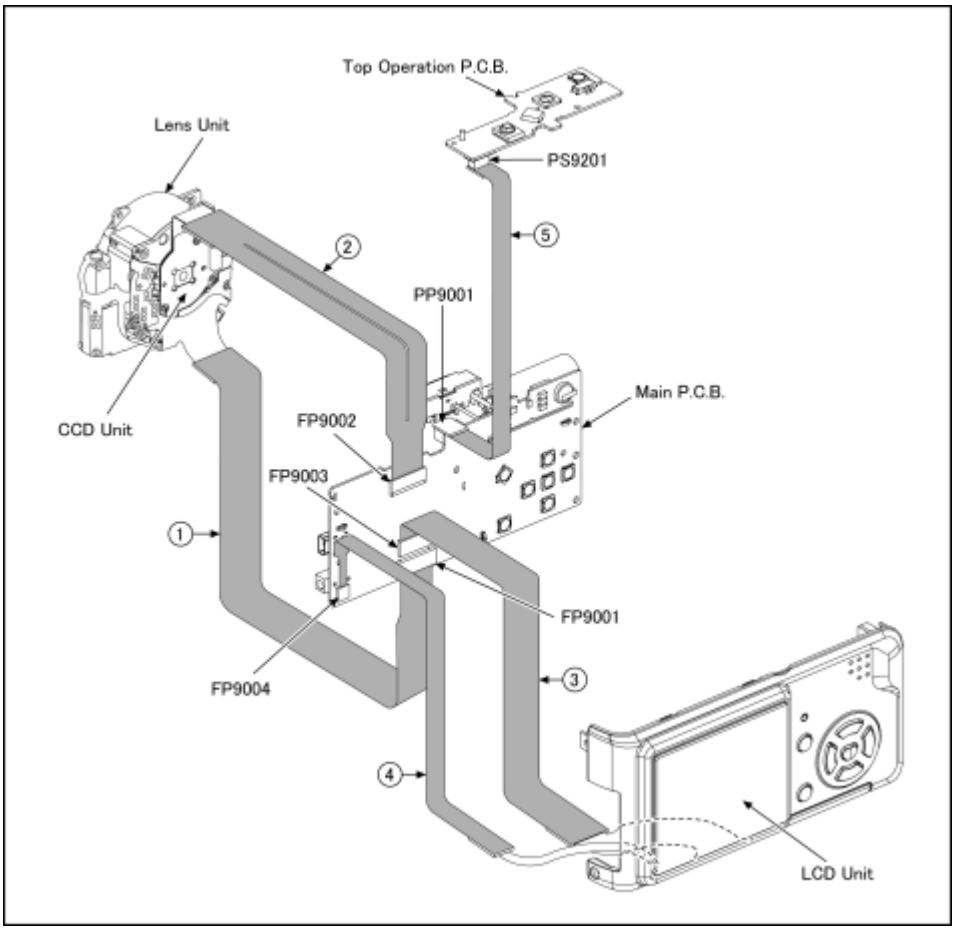
The adjustment instruction is available at “software download” on the “Support Information from NWBG/VDBG-PAVC” web-site in “TSN system”, together with Maintenance software.

## 7.3 Service Position

This Service Position is used for checking and replacing parts. Use the following Extension cables for servicing.

Table S1 Extension Cable List

| No. | Parts No. | Connection | Form |
|---|---|---|---|
| 1 | VFK1951 | FP9001 (MAIN) - MASTER FLANGE UNIT | 39PIN 0.3 FFC |
| 2 | VFK1582A2125 | FP9002 (MAIN) - CCD UNIT | 21PIN 0.5 FFC |
| 3 | RFKZ0354 | FP9003 (MAIN) - LCD UNIT | 37PIN 0.3 FFC |
| 4 | VFK1974 | FP9004 (MAIN) - LCD UNIT | 4PIN 0.5 FFC |
| 5 | VFK1906 | PP9001 (MAIN) - PS9201 (TOP OPERATION) | 30PIN B to B |

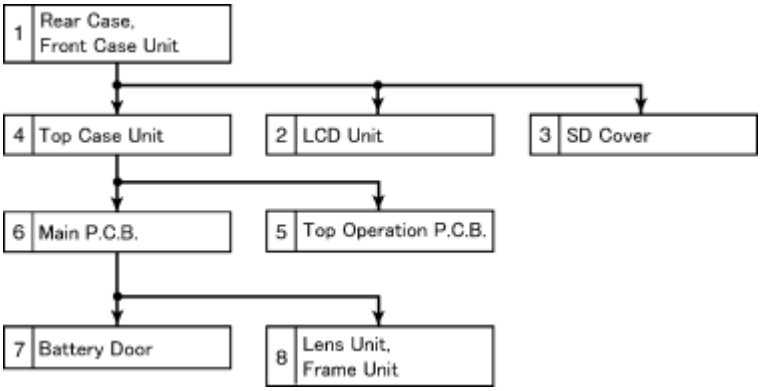



**CAUTION-1. (When servicing MAIN PCB)**

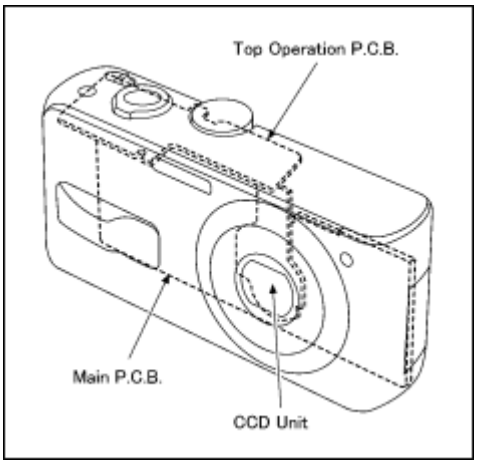
1. Be sure to discharge the capacitor on MAIN PCB.
   Refer to “How to Discharge the Capacitor on Main PCB”.
   The capacitor voltage is not lowered soon even if the AC Cord is unplugged or the battery is removed.
2. Be careful of the high voltage circuit on MAIN PCB.
3. DO NOT allow other parts to touch the high voltage circuit on MAIN PCB.

# 8 Disassembly and Assembly Instructions

## 8.1 Disassembly Flow Chart




## 8.2 PCB Location




## 8.3 Disassembly Procedure

| No. | Item | Fig | Removal |
|---|---|---|---|
| 1 | Rear Case, Front Case Unit | Fig. D1 | Card |
| | | | Battery |
| | | | 5 Screws (A) |
| | | | 1 Screw (B) |
| | | | FP9003(Flex) |
| | | | FP9004(Flex) |
| | | | 3 Locking tabs |
| | | | Rear Case Unit |
| | | Fig. D2 | About the connector |
| | | | How to discharge the capacitor |
| | | Fig. D3 | 1 Screw (C) |
| | | | 2 Locking tabs |
| | | | Front Case Unit |
| | | | |

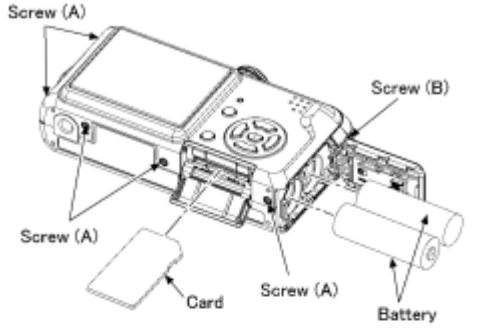
| | | | |
|---|---|---|---|
| 2 | LCD Unit | Fig. D4 | 1 Screw (D) |
| | | | LCD Holder |
| | | | LCD Unit |
| 3 | SD Cover | Fig. D5 | SD Cover Spring |
| | | | SD Cover |
| 4 | Top Case Unit | Fig. D6 | 1 Screw (E) |
| | | | PP9001(Connector) |
| | | | Top Case Unit |
| 5 | Top Operation PCB | Fig. D7 | 1 Screw (F) |
| | | | 2 Locking tabs |
| | | | Top Operation PCB |
| 6 | Main PCB | Fig. D8 | 4 Screws (G) |
| | | | FP9001(Flex) |
| | | | FP9002(Flex) |
| | | | 4 Solders |
| | | | Main PCB |
| | | Fig. D9 | About the connector |
| 7 | Battery Door | Fig. D10 | Shaft |
| | | | Battery Door |
| 8 | Lens Unit, Frame Unit | Fig. D11 | 3 Screws (H) |
| | | | Lens Unit |
| | | | Frame Unit |

### 8.3.1 Removal of the Rear Case and Front Case Unit

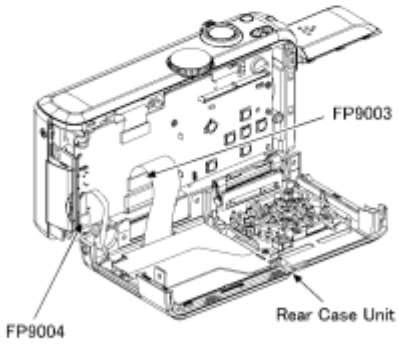
**Fig. D1**

**NOTE:**
When servicing and reassembling, remove the card and battery from the unit.

| | | |
|---|---|---|
| ・Card | ・Screw (A) × 5 | ・FP9003(Flex) |
| ・Battery | ・Screw (B) × 1 | ・FP9004(Flex) |
| | | ・Locking tab × 3 |








**CAUTION**
Take care to handle the connector (FP9003) because it is easy to be damaged.
(Refer to "About the connector (FP9003)".)

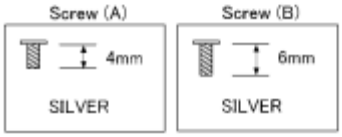
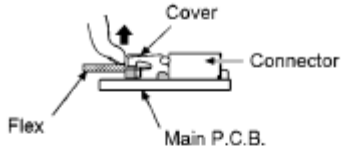


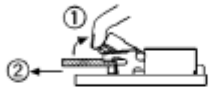

Fig. D2

About the connector (FP9003)

1. Lift the center of cover in the indicated by arrow.

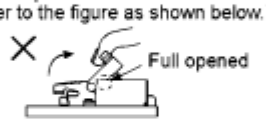



2. Release the lock of cover, and then pull out the flex.

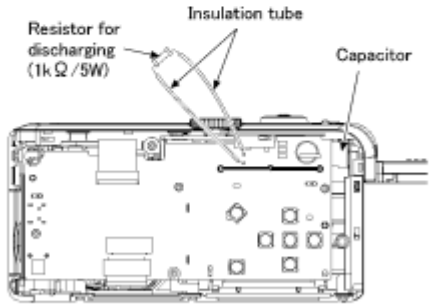



※ It is released the lock to turn the cover until an angle of 40.

**NOTE:** Do not push the cover over an angle of 135.
It is full opened condition.
(Refer to the figure as shown below.)




How to discharge the capacitor

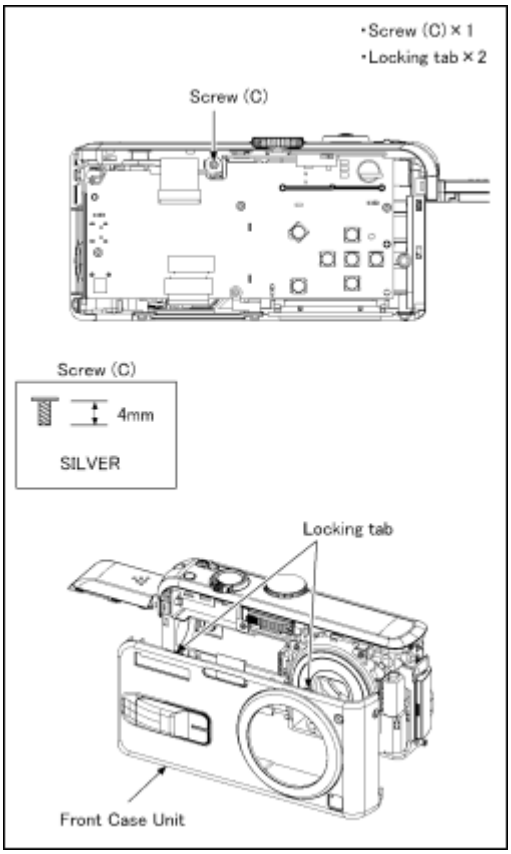



⚠ **CAUTION**

**Be sure to discharge the capacitor unit.**

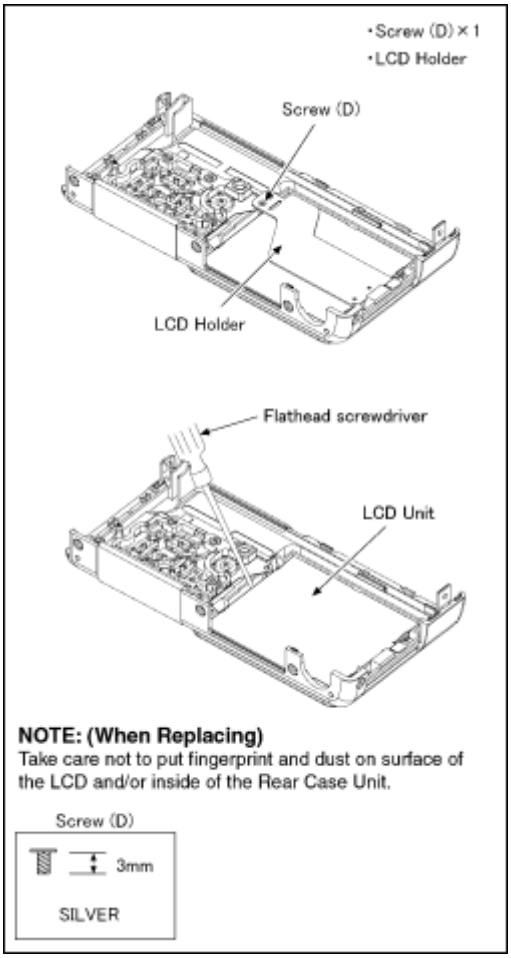
1. Put the insulation tube on the lead part of resistor (ERG5SJ102: 1kΩ/5W).
2. Put the resistor between both terminals of capacitor unit for approx. 5 seconds.

**Fig. D3**



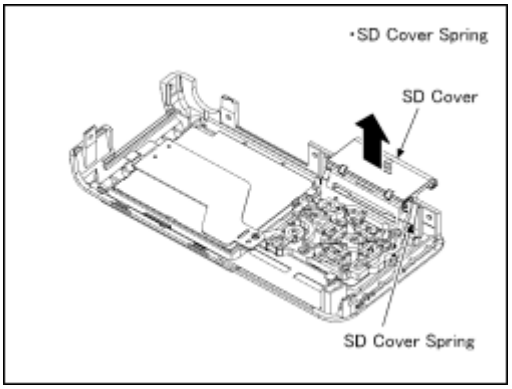

## 8.3.2 Removal of the LCD Unit

Fig. D4



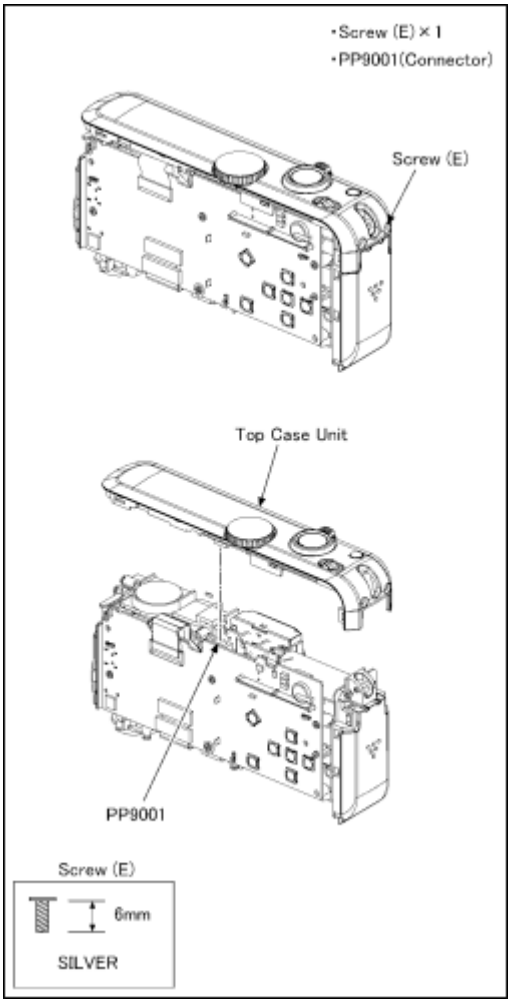
### 8.3.3 Removal of the SD Cover

Fig. D5



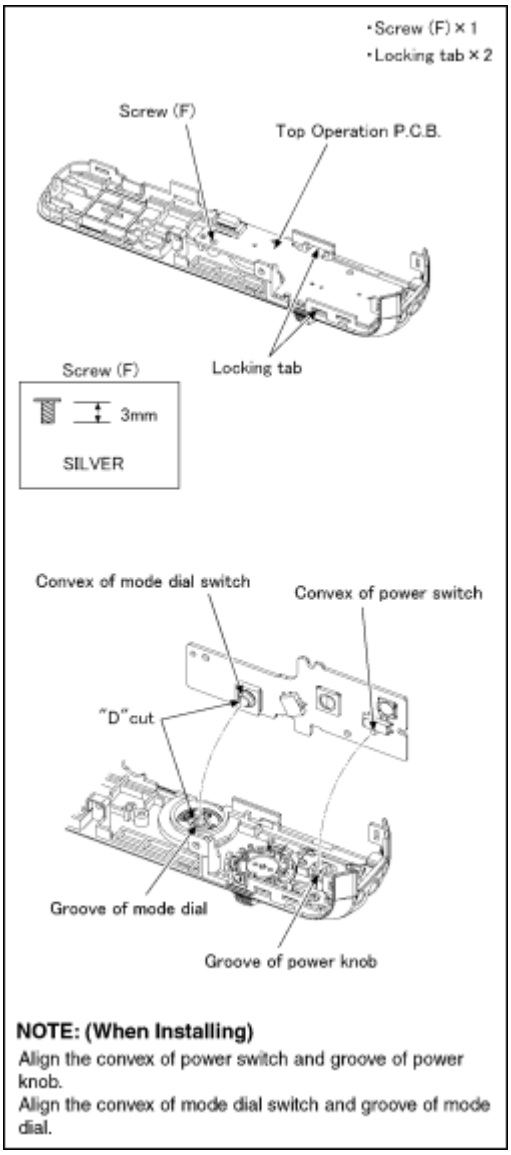

### 8.3.4 Removal of the Top Case Unit

Fig. D6



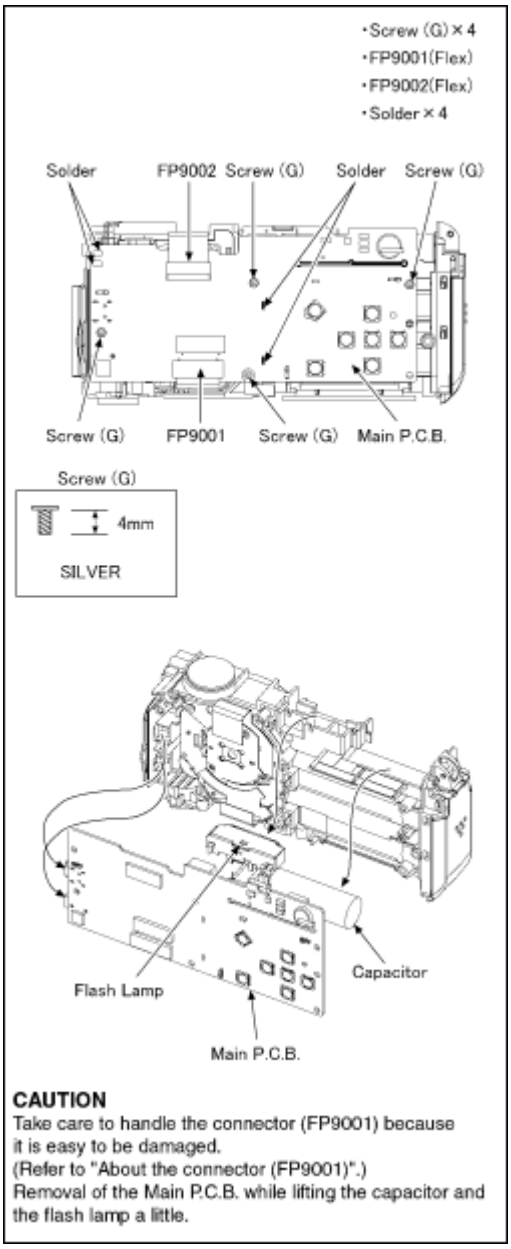

### 8.3.5 Removal of the Top Operation PCB

Fig. D7




## 8.3.6 Removal of the Main PCB

Fig. D8

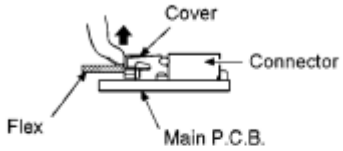



**CAUTION**
Take care to handle the connector (FP9001) because it is easy to be damaged.
(Refer to "About the connector (FP9001)".)
Removal of the Main P.C.B. while lifting the capacitor and the flash lamp a little.

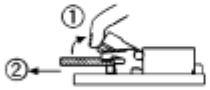
**Fig. D9**

About the connector (FP9001)

1. Lift the center of cover in the indicated by arrow.




2. Release the lock of cover, and then pull out the flex.

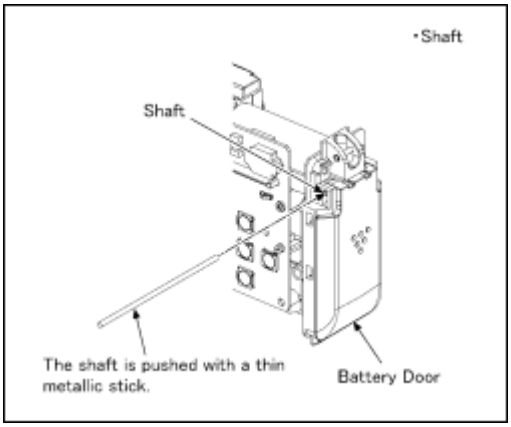



※ It is released the lock to turn the cover until an angle of 40.

**NOTE:** Do not push the cover over an angle of 135. It is full opened condition. (Refer to the figure as shown below.)

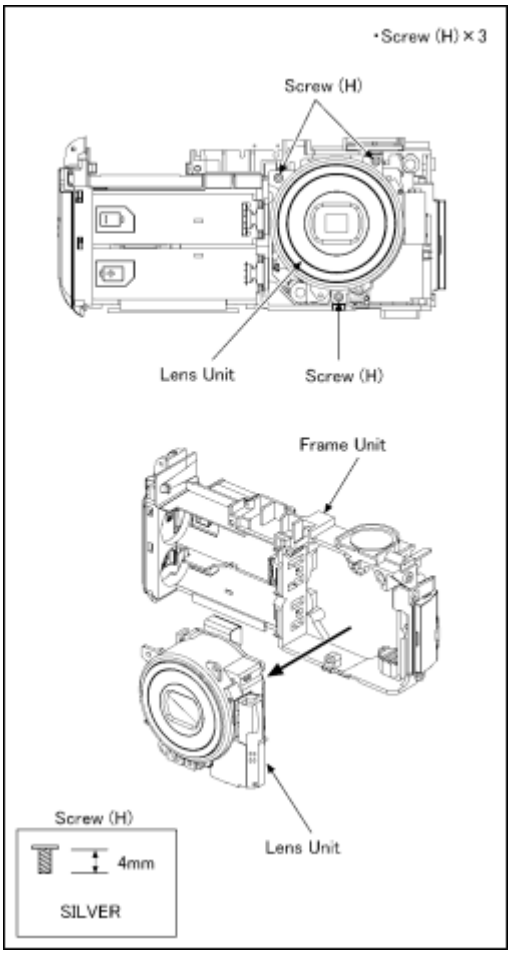

## 8.3.7 Removal of the Battery Door

**Fig. D10**




## 8.3.8 Removal of the Lens Unit and Frame Unit

**Fig. D11**




**NOTE: (When Assembling)**
Be sure to confirm the following points when assembling.

- The Screw is tightened enough.
- Assembling conditions are fine. (No distortion, no illegal-space.)
- No dust and/or dirt on every Lens surfaces.
- LCD image is fine. (No dust and dirt on it, and no gradient images.)

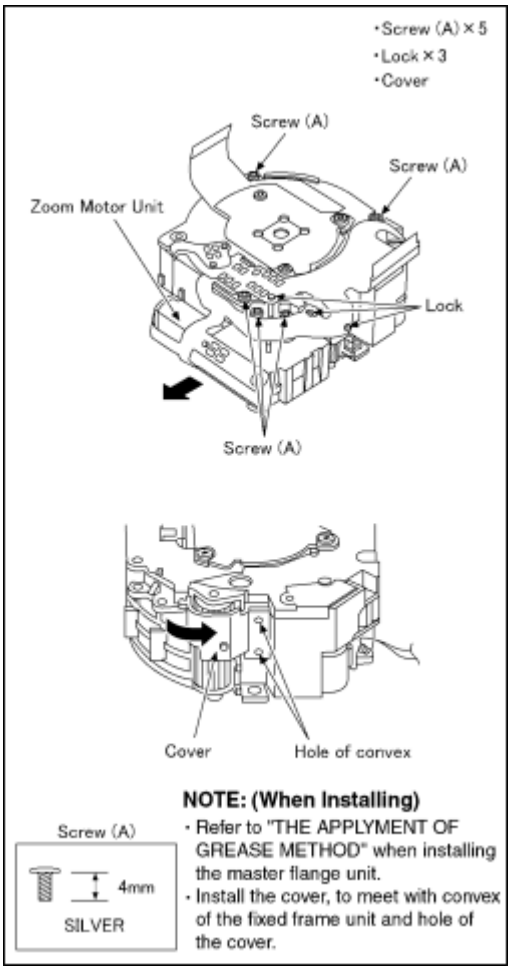
# 8.4 Disassembly Procedure for the Lens

**NOTE: When Disassembling and Assembling for the Lens**

1. To minimize the possibility of the CCD being dirt, perform disassemble and/or assemble under the condition of the CCD is being mounted.
2. Take care that the dust and dirt are not entered into the lens.
   In case of the dust is putted on the lens, blow off them by airbrush.
3. Do not touch the surface of lens.
4. Use lens cleaning KIT (BK)(VFK1900BK).

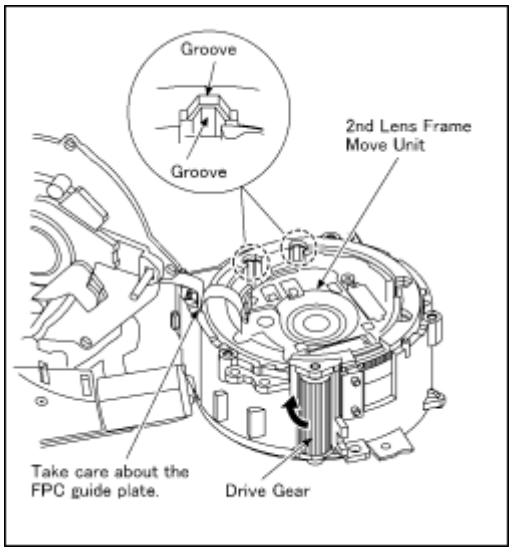
## 8.4.1 Removal of the Zoom Motor Unit and Master Frange Unit

1. Remove the lock (3 points).
2. Unscrew the 5 screws (A).
3. Remove the Zoom Motor Unit to the indicated by arrow.
4. Remove the Cover to the indicated by arrow.
5. Remove the Master Frange unit.

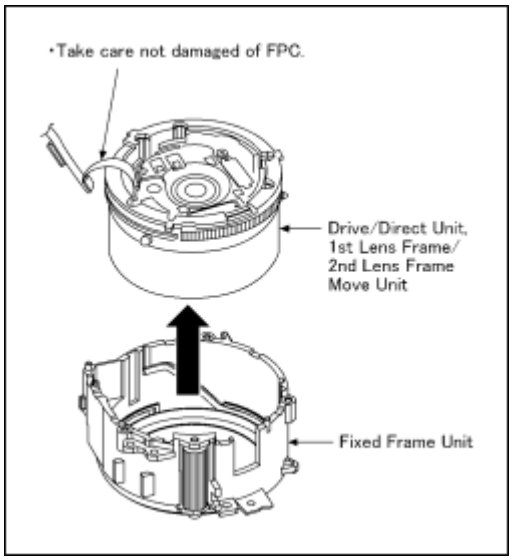



## 8.4.2 Removal of the Drive/Direct Unit, 1st Lens Frame/2nd Lens Frame Move Unit

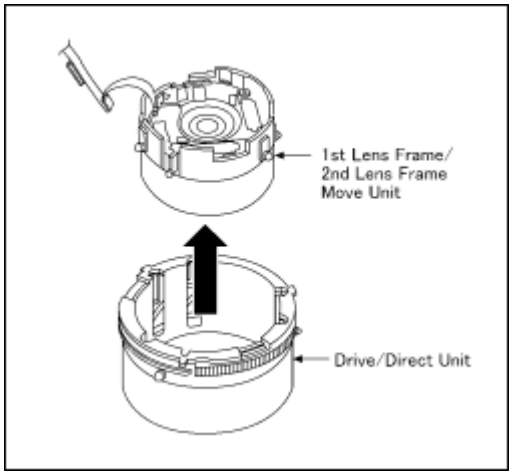
1. Turn the drive gear to the indicated by arrow fully.



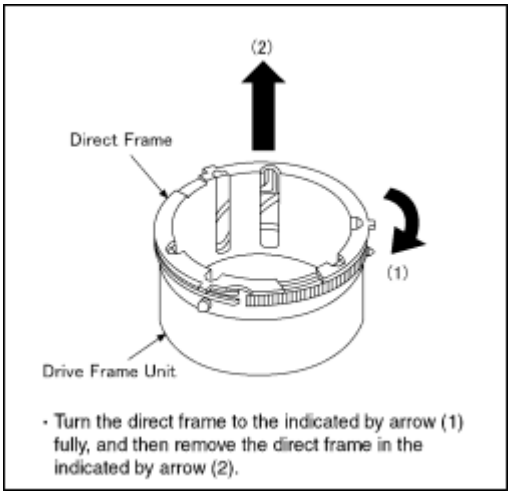

2. Push the drive unit to the indicated by arrow from lens side, and then remove the unit of drive/direct unit, 1st lens frame/2nd lens frame move unit from the fixed frame unit.



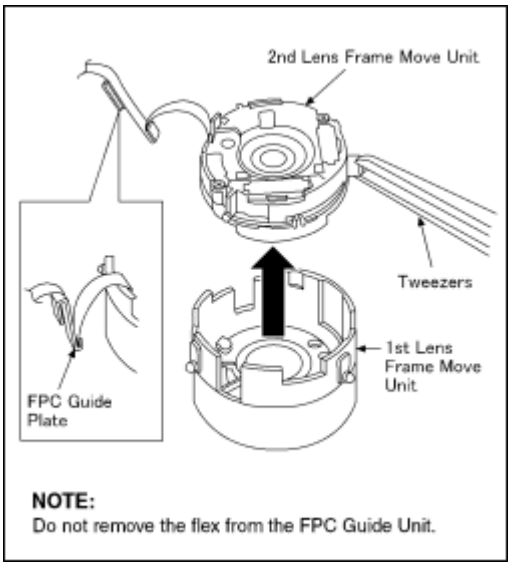

3. Push the 1st lens frame unit to the indicated by arrow from lens side, and then remove the unit of 1st lens frame/2nd lens frame move unit from the drive/direct unit.




### 8.4.3 Removal of the Direct Frame

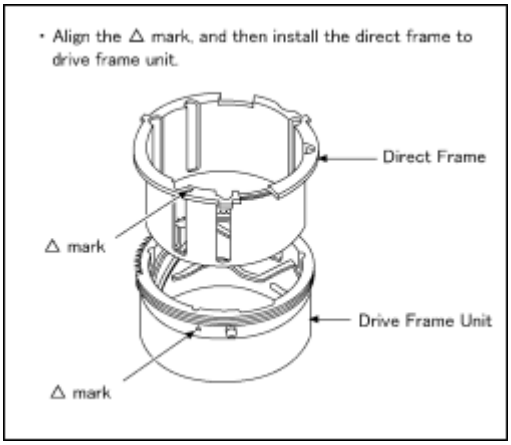


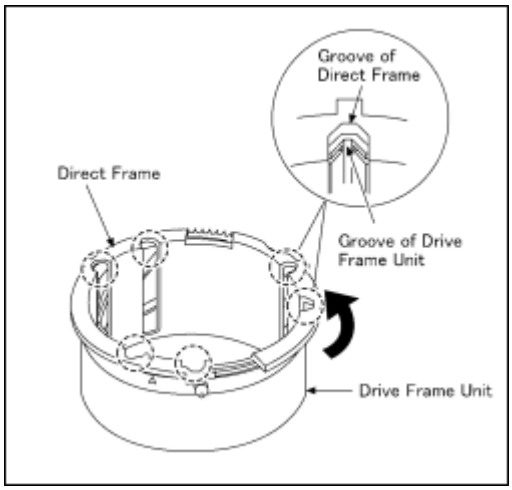

### 8.4.4 Removal of the 2nd Lens Frame Move Unit



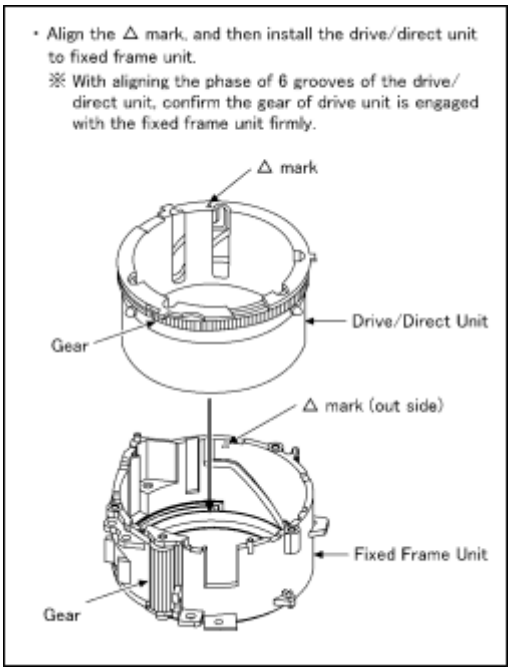

# 8.5 Assembly Procedure for the Lens

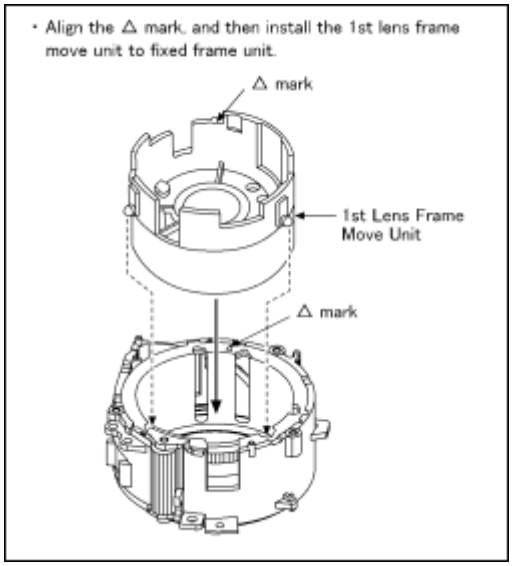
## 8.5.1 Phase alignment of the Direct Frame and Drive Frame Unit



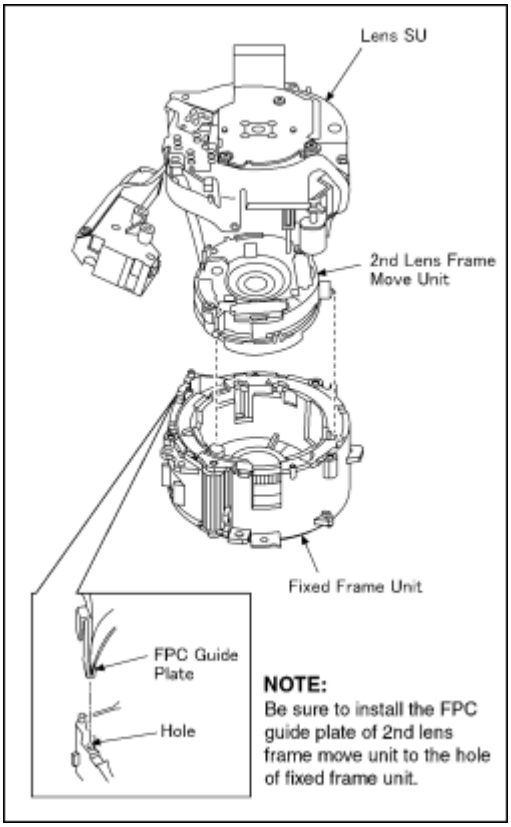



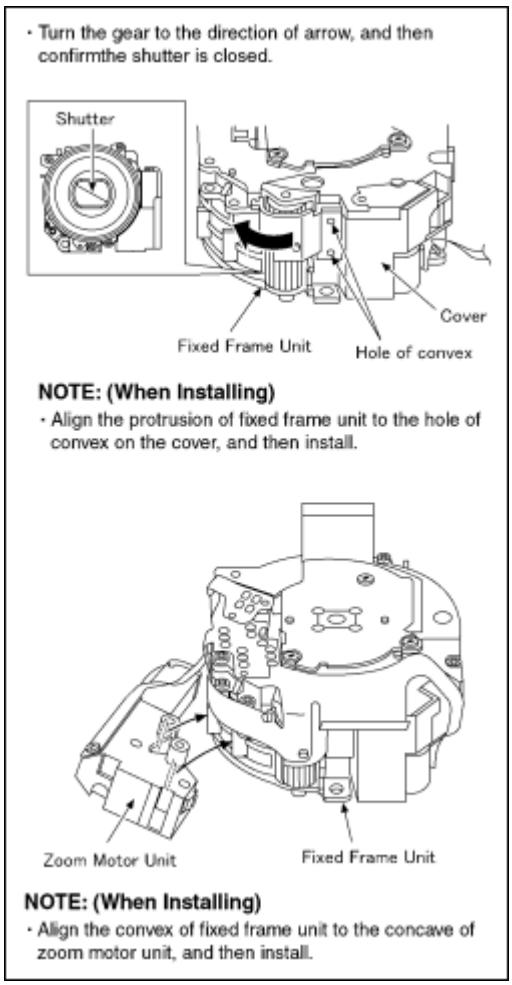

## 8.5.2 Phase alignment of the Drive/Direct Unit and Fixed Frame

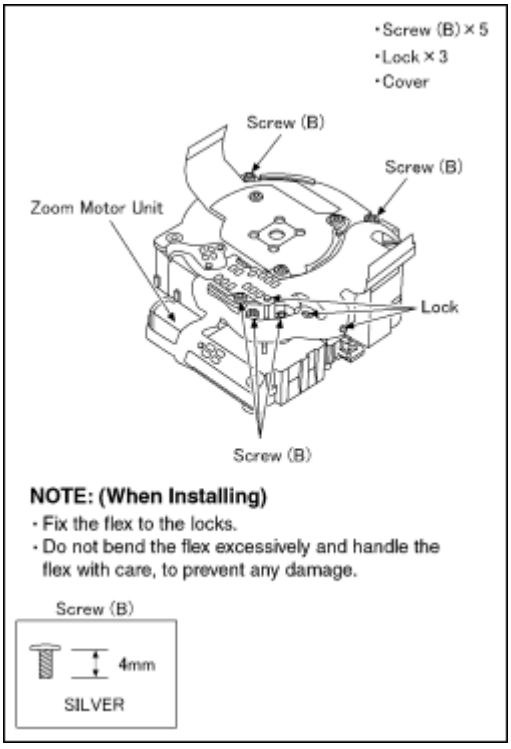


### 8.5.3 Assembly for the Zoom Motor Unit and Master Flange Unit



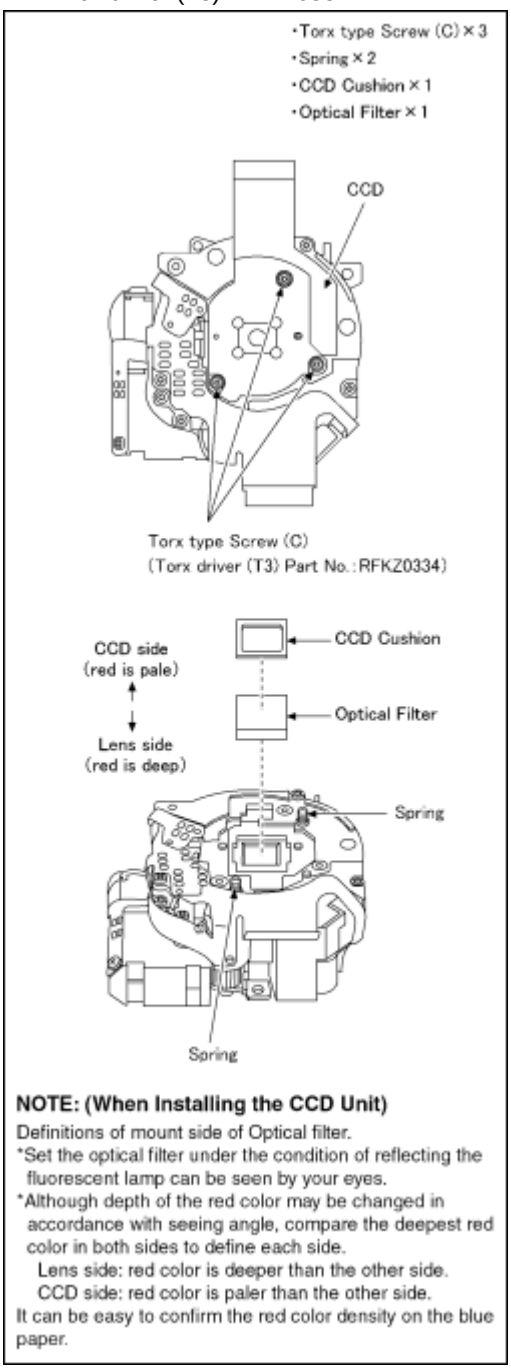




# 8.6 Removal of the CCD

**To prevent the CCD unit from catching the dust and dirt, do not remove the CCD unit except for replacing.**

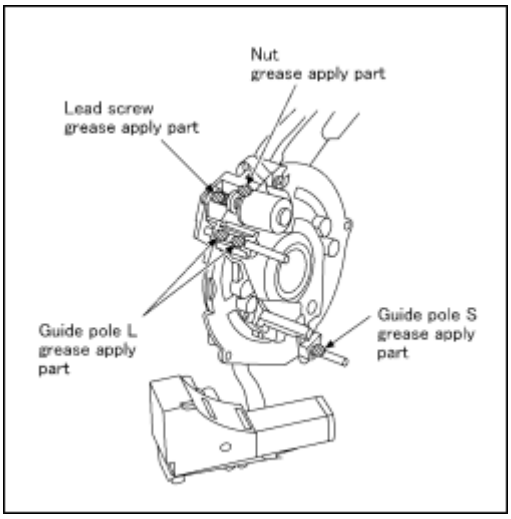
- Trox driver (T3): RFKZ0334




# 8.7 The Applyment of Grease Method

The grease apply point of lens unit are as follows.
Apply grease additionally in the specified position if necessary.

- Lead screw, Nut
  - Grease: VFK1850 (Furoyl type)
  - Amount of apply: 2 - 4 mg
- Gide pole S and Guide pole L
  - Grease: VFK1829
  - Amount of apply: 2 - 4 mg


Nut
grease apply part
Lead screw
grease apply part
Guide pole L
grease apply
part
Guide pole S
grease apply
part

# 9 Measurements and Adjustments

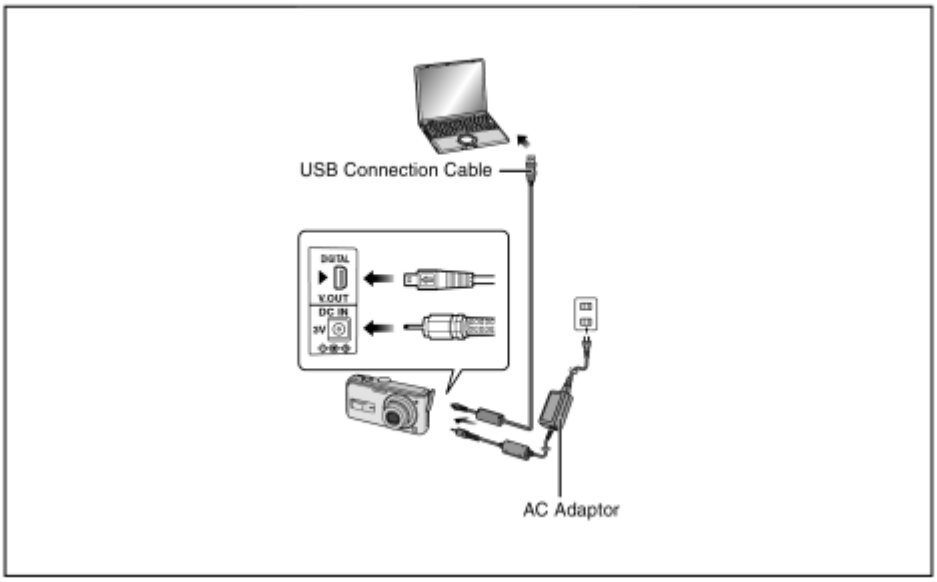
## 9.1 Matrix Chart for Replaced Part and Necessary Adjustment

The relation between Replaced part and Necessary Adjustment is shown in the following table.
When concerned part is replaced, be sure to achieve the necessary adjustment(s).
As for Adjustment condition/procedure, consult the “Adjustment Manual” which is available in Adjustment software.
The Adjustment software is available at “TSN Website”, therefore, access to “TSN Website” at “Support Information from NWBG/VDBG-PAVC”.

**NOTE:**
After adjustments have been terminated, make sure to achieve “INITIAL SETTINGS”.

| Adjustment Item | | Replaced Part | | | | |
|---|---|---|---|---|---|---|
| | | Main P.C.B. | VENUS (IC6001) | Flash-ROM (IC6002) | Lens Part (Excluding CCD) | CCD Unit |
| Camera Section | OIS hall element adjustment (OIS) | O | O | O | O | |
| | Back focus adjustment (BF) | O | O | O | O | |
| | Shutter adjustment (SHT) | O | O | O | O | O |
| | ISO sensitivity adjustment (ISO) | O | O | O | O | O |
| | AWB adjustment<br>High brightness coloration inspection (WBL) | O | O | O | O | O |
| | CCD white scratch compensation (WKI) | O | O | O | | O |

**NOTE:**
*There is no LCD adjustment in this model.
*There is no CCD Black scratch compensation adjustment (BKI) in this model.



# 10 Maintenace

## 10.1 Cleaning Lens and LCD Panel

Do not touch the surface of lens and LCD Panel with your hand.
When cleaning the lens, use air-Blower to blow off the dust.
When cleaning the LCD Panel, dampen the lens cleaning paper with lens cleaner, and the gently wipe the their surface.

**Note:**
The Lens Cleaning KIT ; VFK1900BK(Only supplied as 10 set/Box) is available as Service Aid.

# POWER BLOCK DIAGRAM

DC JACK
BATTERY
CL1001
F1001
CL1002
CL1007
F1002
BAT+
CL1008
BAT-
QR1005
QR1003
QR1001
Q1007
(MOS-FET: Nch)
Q1008
(MOS-FET: Nch)
UNREG
5V
CL1010
CL1020
AF3.4V
To IC7001
(A3.1V)
IC7002
(REGULATOR)
VIN
VOUT
CONTROL CIRCUIT
OVER HEAT& OVER CURRENT PROTECTION
BANDGAP REFERENCE
VCONT
GND
NP
IC1001
(7CH SW REGULATOR IC)
SCP
VBAT
PVCC
CH1 (N/Pch)
CH2 (N/Pch)
CH3 (N/Pch)
CH4 (N/Pch)
CH5 (Pch)
CH6 (Nch)
CH7 (Nch)
HX1
LX1
INV1
PGND12
HX2
LX2
INV2
PGND12
HX3
LX3
INV3
PGND34
HX4
LX4
INV4
PGND34
PVCC5
OUT5
NON5
HS6H
HS6L
PGND567
LX6
INV6
HS7H
HS7L
OUT7
INV7
INV7I
VREF
UDSEL1
UDSEL2
UDSEL4
STEP UP/ DOWN SEL.
ROOD SW
STB1
STB2
STB3
STB4
STB5
STB6
STB7
ON/OFF LOGIC
RT
OSC
UVLO
STB
SOFT START
VCC
VREGA
REG A
GND
CL1030
D2.9V
CL1040
D1.2V
CL1051
CCD12V
CL1060
To CCD
(CCD MINUS)
CL1070
BL PLUS
CL1071
BL MINUS
To IC6001-212
(BL CHANGE)
To IC9101-34
(POWER ON H)
Q1005
(MOS-FET: Nch)
Q1031
(MOS-FET: Nch)
Q1041
(MOS-FET: Nch)
QR1041
Q1060
(MOS-FET: Pch)
QR1060
CCD MINUS
−6.18 V
Q1070
(MOS-FET: Nch)
Q1071
QR1002
TOP OPERATION P.C.B.
POWER SW
ON
OFF
CL9212
CL9097
PS9201 7
PP9001 7
PS9201 1-3,18-20
PP9001 1-3,18-20
IC9101
(SYSTEM)
NACADP
SCP
UNREG
POWERSW
VDD
RESETIN
RESETOUT
POWERON
POWERSON(L)
POWERSON(H)
SW UNREG
RL9105
RL9116
D2.9V
IC6001
(VENUS PLUS)
POWER SW ON
ACADP DETECT
POWER ON H
RSTB
CPUREB
MON BLT
CCD POWER
IC6002
(FLASH ROM/128Mbit)
DSE
MRES
RE
RL6003
D6001
RL6054
RL6004
TO LCD UNIT
(FP9003-34)

IC9101- 32
(D2.9V)
RL6003
(SYS RESET)
RL6054
(CPU RESET)
RL6004
(CPURE)
2.0V 5msec./DIV

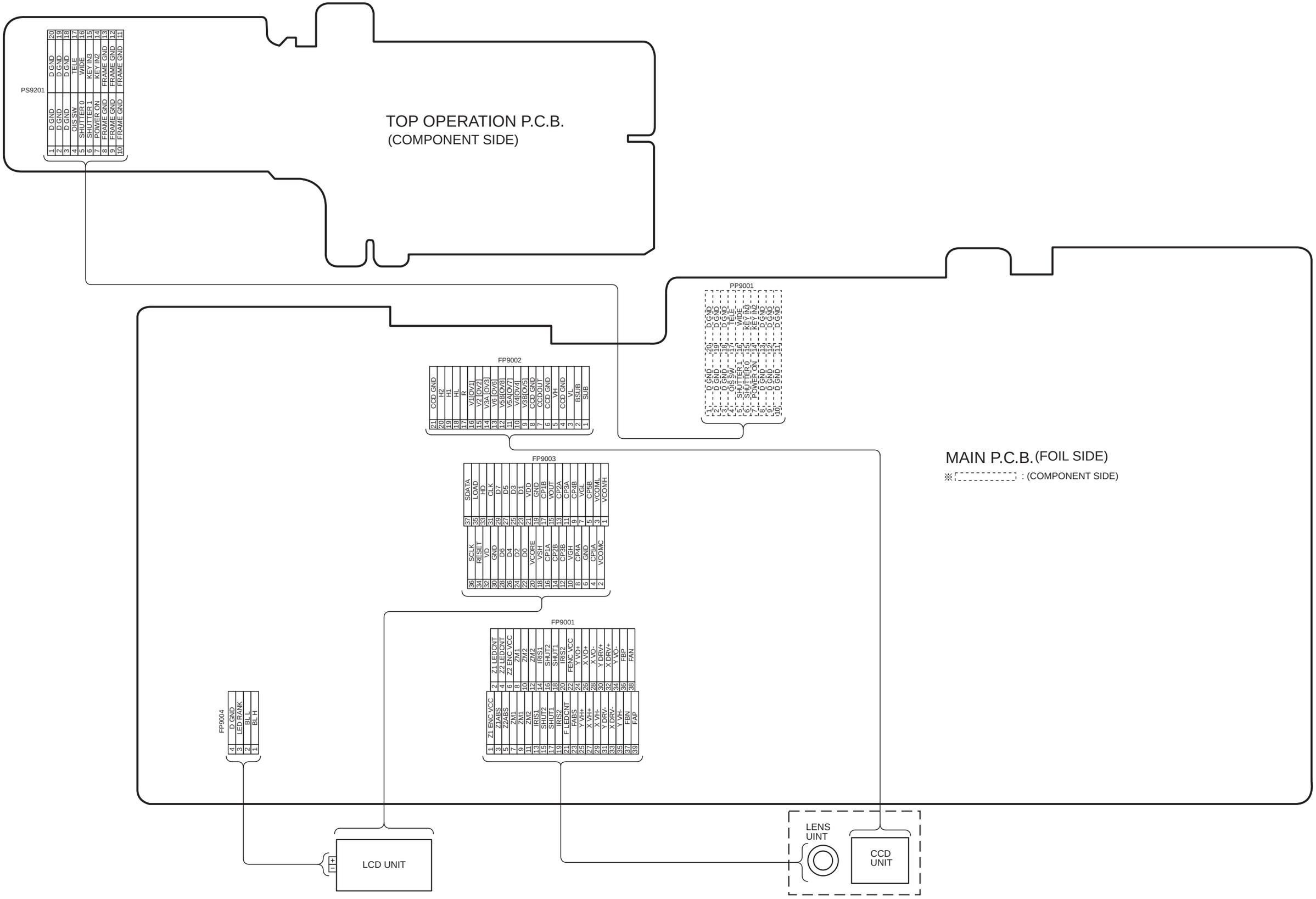
Note: 1.* Be sure to make your orders of replacement parts according to this list.

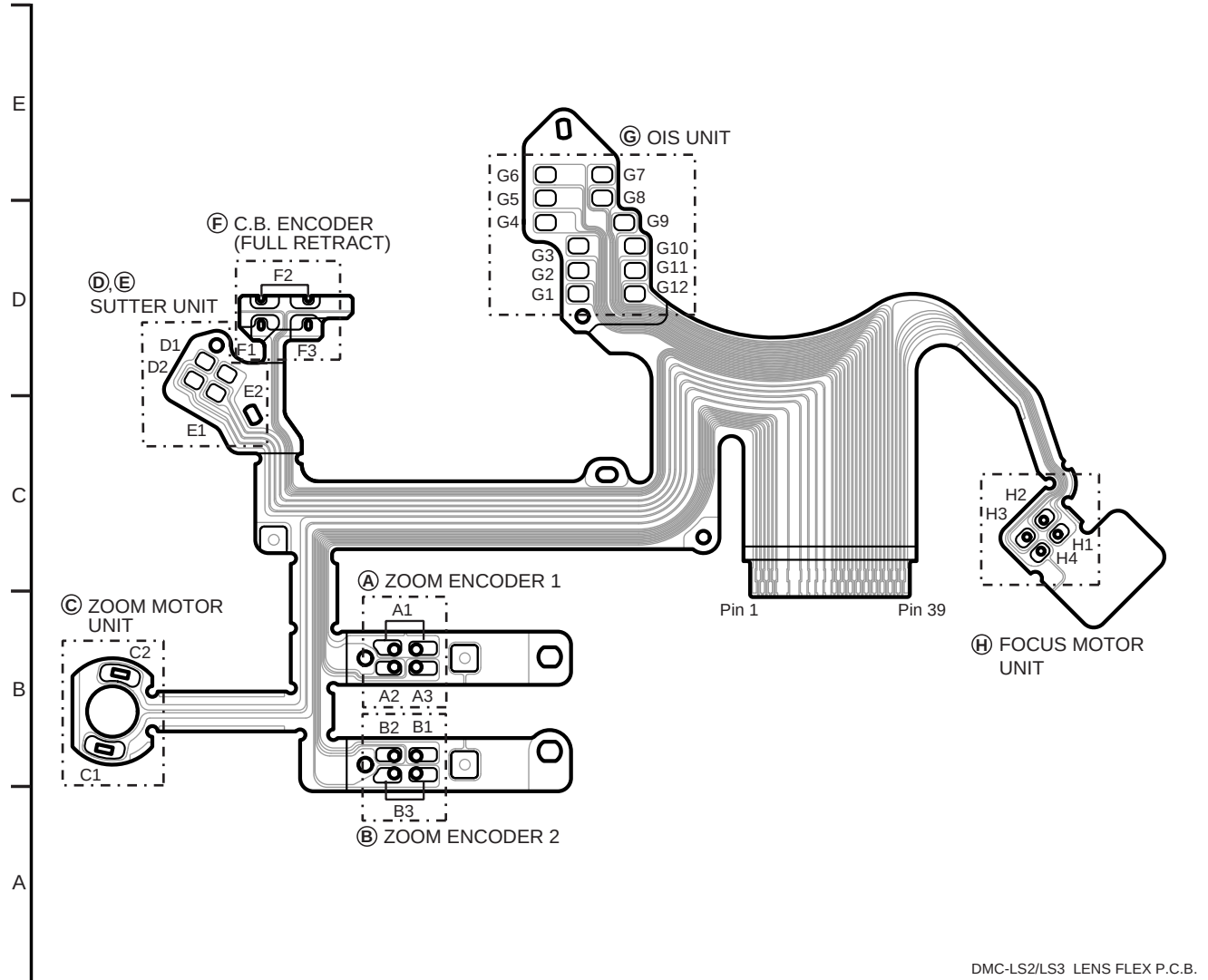
2. IMPORTANT SAFETY NOTICE
   Components identified with the mark ⚠ have the special characteristics for safety.
   When replacing any of these components, use only the same type.
3. Unless otherwise specified,
   All resistors are in OHMS, K=1,000 OHMS. All capacitors are in MICRO-FARADS (uf), P=uuF.
4. The marking (RTL) indicates the retention time is limited for this item. After the discontinuation of this assembly in production, it will no longer be available.

**E.S.D. standards for Electrostatically Sensitive Devices, refer to "PREVENTION OF ELECTROSTATIC DISCHARGE (ESD) TO ELECTROSTATICALLY SENSITIVE (ES) DEVICES" section.**

**Definition of Parts supplier:**

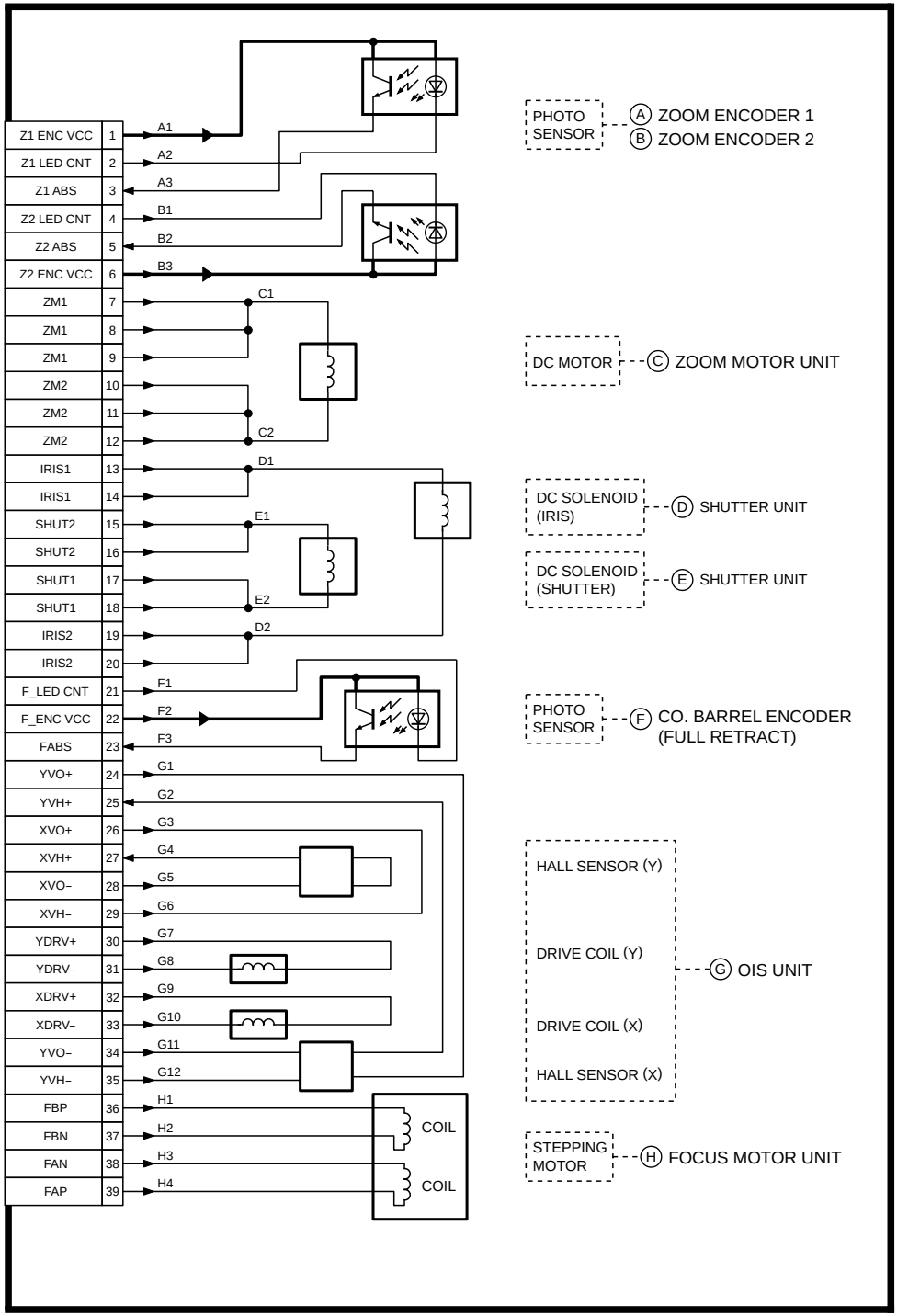
1. **Parts marked with [PAVC-CSG] in the remarks column are supplied from PAVC COMPANY CS Group (PAVC-CSG).**
   **Others are supplied from "PAVCSG" (ASPC).**


PS9201
1 D GND
2 D GND
3 D GND
4 OIS SW
5 SHUTTER 0
6 SHUTTER 1
7 POWER ON
8 FRAME GND
9 FRAME GND
10 FRAME GND
20 D GND
19 D GND
18 D GND
17 TELE
16 WIDE
15 KEY IN3
14 KEY IN2
13 FRAME GND
12 FRAME GND
11 FRAME GND
TOP OPERATION P.C.B.
(COMPONENT SIDE)
PP9001
1 D GND
2 D GND
3 D GND
4 OIS SW
5 SHUTTER 1
6 SHUTTER 0
7 POWER ON
8 D GND
9 D GND
10 D GND
20 D GND
19 D GND
18 D GND
17 TELE
16 WIDE
15 KEY IN3
14 KEY IN2
13 D GND
12 D GND
11 D GND
FP9002
21 CCD GND
20 H2
19 H1
18 HL
17 R
16 V1(OV1)
15 V2 (OV2)
14 V3A (OV3)
13 V6 (OV6)
12 V5B(OV8)
11 V5A(OV7)
10 V4(OV4)
9 V3B(OV5)
8 CCD GND
7 CCDOUT
6 CCD GND
5 VH
4 CCD GND
3 VL
2 BSUB
1 SUB
FP9003
37 SDATA
35 LOAD
33 HD
31 CLK
29 D7
27 D5
25 D3
23 D1
21 VDD
19 GND
17 CP1B
15 VOUT
13 CP2A
11 CP3A
9 CP4B
7 VGL
5 CP5B
3 VCOML
1 VCOMH
36 SCLK
34 RESET
32 VD
30 GND
28 D6
26 D4
24 D2
22 D0
20 VCORE
18 VSH
16 CP1A
14 CP2B
12 CP3B
10 VGH
8 CP4A
6 GND
4 CP5A
2 VCOMC
FP9001
2 Z1 LEDCNT
4 Z2 LEDCNT
6 Z2 ENC VCC
8 ZM1
10 ZM2
12 ZM2
14 IRIS1
16 SHUT2
18 SHUT1
20 IRIS2
22 FENC VCC
24 Y VO+
26 X VO+
28 X VO-
30 Y DRV+
32 X DRV+
34 Y VO-
36 FBP
38 FAN
1 Z1 ENC VCC
3 Z1ABS
5 Z2ABS
7 ZM1
9 ZM1
11 ZM2
13 IRIS1
15 SHUT2
17 SHUT1
19 IRIS2
21 F LEDCNT
23 FABS
25 Y VH+
27 X VH+
29 X VH-
31 Y DRV-
33 X DRV-
35 Y VH-
37 FBN
39 FAP
FP9004
4 D GND
3 LED RANK
2 BL L
1 BL H
MAIN P.C.B. (FOIL SIDE)
※ : (COMPONENT SIDE)
LCD UNIT
LENS UINT
CCD UNIT


E
D
C
B
A
1
2
3
4
5
6
Ⓖ OIS UNIT
G6
G5
G4
G7
G8
G9
G3
G2
G1
G10
G11
G12
Ⓕ C.B. ENCODER
(FULL RETRACT)
F2
F1
F3
Ⓓ,Ⓔ
SUTTER UNIT
D1
D2
E2
E1
Ⓐ ZOOM ENCODER 1
A1
A2
A3
B2
B1
B3
Ⓑ ZOOM ENCODER 2
Ⓒ ZOOM MOTOR
UNIT
C2
C1
Pin 1
Pin 39
H2
H3
H1
H4
Ⓗ FOCUS MOTOR
UNIT

## LENS FLEX SCHEMATIC DIAGRAM

: POSITIVE VOLTAGE LINE



# ◆About Indication of the schematic diagram

## IMPORTANT SAFETY NOTICE:

COMPONENTS IDENTIFIED WITH THE MARK ⚠ HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS USE ONLY THE SAME TYPE.

1.Although reference number of the parts is indicated on the P.C.B. drawing and/or schematic diagrams, it is NOT mounted on the P.C.B. when it is displayed with "$" mark.

2.It is only the "Test Round" and no terminal (Pin) is available on the P.C.B. when the TP (Test Point) indicated as "●" mark.

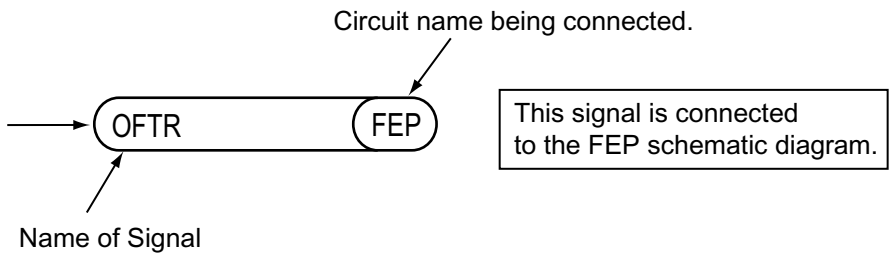
3.The voltage being indicated on the schematic diagram is measured in "Standard-Playback" mode when there is no specify mode is mentioned.

4.Although the voltage and waveform available on here is measured with standard frame, it may be differ from actual measurement due to modification of circuit and so on.

5.The voltage being indicated here may be include observational-error (deviation) due to internal-resistance and/or reactance of equipment. Therefore, handle the value indicated on here as reference.

6.Use the parts number indicated on the Replacement Parts List .

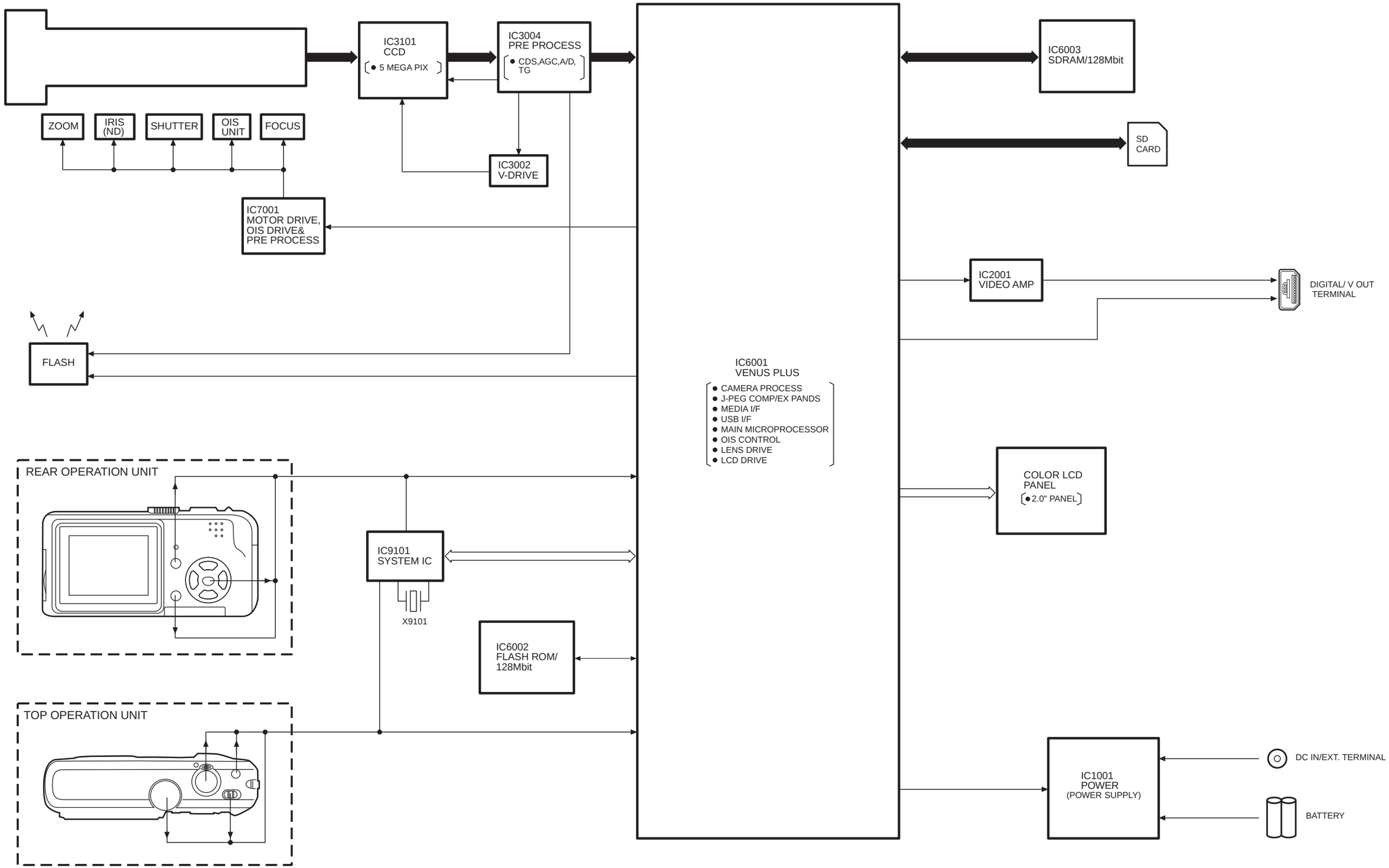
7.Indication on Schematic diagrams:



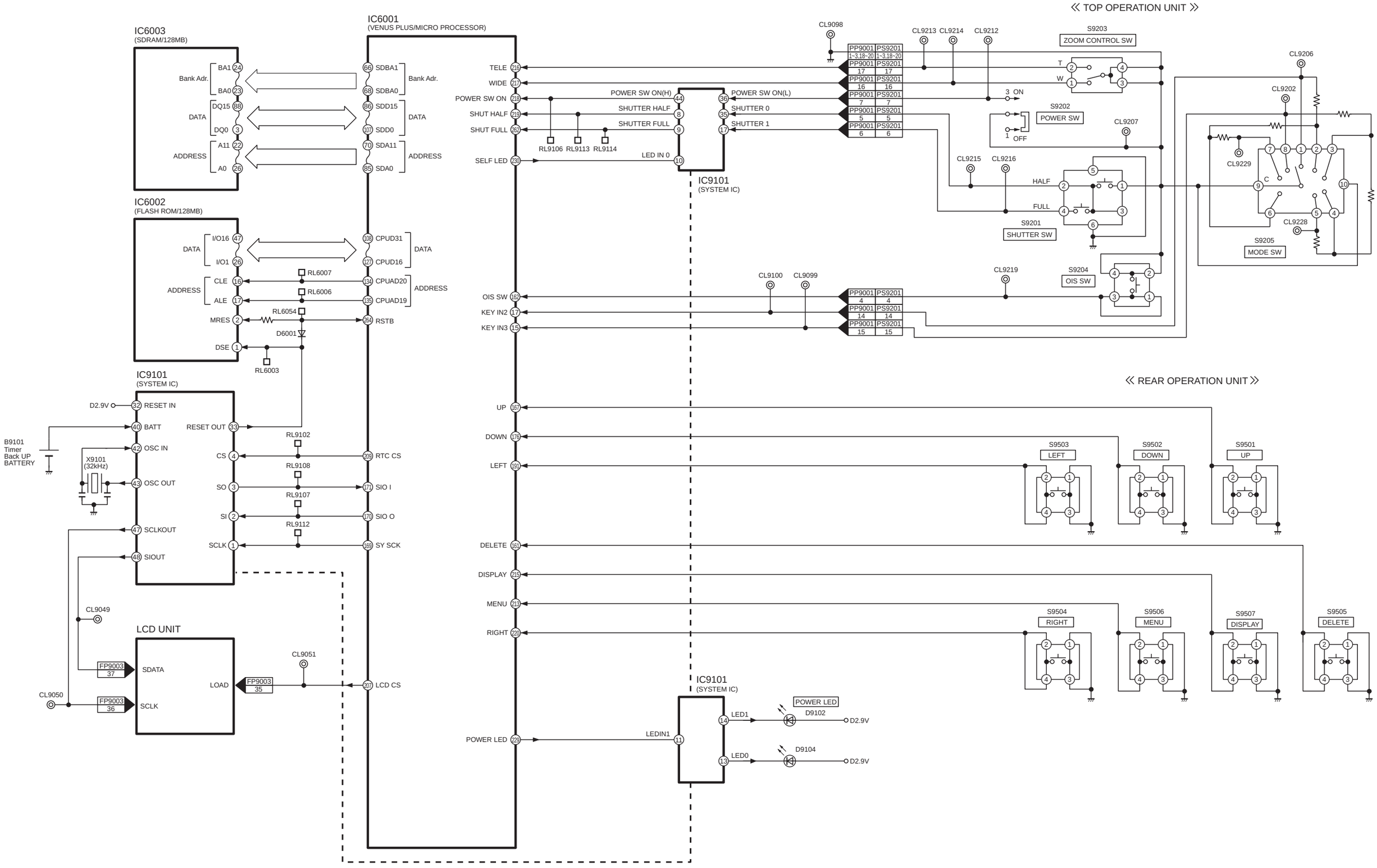

8.Try to click on the subject repeatedly when the drawing screen link does not working properly.

Since data volume for double sides P.C.B. is heavy, it might be taking time for display and/or access.

# OVERALL BLOCK DIAGRAM



# SYSTEM CONTROL BLOCK DIAGRAM



# VIDEO/AUDIO PROCESS BLOCK DIAGRAM

IC6003
(SDRAM/128M-bit)

128Mbit(1Mx32bitx4pcs)

BANK0 BANK2
BANK1 BANK3
Y DECODERS
X DECODERS
COLUMN DECODER
ROW DECODER
I/O BUFFER & GATE
ADDRESS BUFFER & REGISTER
TIMING & MODE REGISTER
DATA
ADDRESS
CTL SIG

IC6001
(VENUS PLUS)

SDD0 SDD1 SDD13 SDD14 SDD15 SDD16 SDD31
SDA0 SDA5 SDA6 SDA11
SDBA0 SDBA1 DRAMFCK SDDQM0 SDDQM1 SDDQM2 SDDQM3 XDCS SDRASB SDCASB SDWEB SDCKE

RAM DATA (RAMD0~31)
RAM ADDRESS (SDA0~11)
RAM CTL (CLK/CS/WEetc.)

SENSOR SECTION
CCD
CDS, AGC A/D
CDS Signal (12Bit)
CCD11
CCD0

[PPU]
PRE PROCESS1
PPM
AUDIO FOCUS
BLOCK MEMORY

MCU

YCMEMCON
PRE PROCESS2
YC PROCESS
ZOM
[YCU]
MPEG MEMCON
MPEG4 CORE
[CDU]
MONMEN
MTX
DIGITAL LCD
ENC
D/A
[VOU]

FCK(24.75MHz)
CCDVD
CCDHD
CCD SSG
MCK48I
MCK48O
X6001 (48MHz)

INTERNAL BUS CONTROL
GPIOU
A/D
DTC
MEIFU SD CORE
MEMIO
EXTDMA

IC6002
(FLASH ROM/128M-bit)
DATA
ADDRESS
CPUD16
CPUD31
CPUAD19
CPUAD20
RL6006
RL6007
RL6054
MRES
RSTB
EXT BUS CONTROL
32 Bit MICRO COMPUTER CORE
USBIF

IC9101
(SYSTEM IC)
RESETOUT

LCDHD
LCDVD
LCD CLK
LCD CS
LCDCOUT0
LCDCOUT1
LCDCOUT2
LCDCOUT3
LCDCOUT4
LCDCOUT5
LCDCOUT6
LCDCOUT7
CL9053 CL9054 CL9063
CL9055 CL9051 CL9064
CL9057 CL9058 CL9059 CL9060 CL9061 CL9062

RL9108 RL9107 RL9112
SIO I
SIO O
SY SCK
VIDEO OUT
VIDEO MUTE

SDD0 SDD1 SDD2 SDD3 SDCMD SDCLK SDCD SDWP
P6401
(SD CARD CONNECTOR)
C.DET
WP

USB CAB IN
USB SIGDM
USB SIGDP

AUDIO AD IN
AUDIO SO
AUDIO SCK
AUDIO CS
AUDIO PWM
RL6002
RL6019
RL6024
RL6014
RL6015

COLOR LCD DRIVE
CP1A
CP1B
VGH
CP2A
CP2B
VGL
VCORE
VOUT
VSH
VCOML
VCOMC
VCOMH
HD
VD
CLK
LOAD
D0
D1
D2
D3
D4
D5
D6
D7
SDATA
SCLK
VDD
RESET
CHARGE PUMP1 BLOCK
CHARGE PUMP2 BLOCK
CHARGE PUMP3 BLOCK
CHARGE PUMP4 BLOCK
CHARGE PUMP5 BLOCK
ANALOG BLOCK
SOURCE DRIVER BLOCK
GATE DRIVER BLOCK
SOURCE DRIVER BLOCK
BIAS
LCD
X1 X2 X3 X238 X239 X240
Y355 Y354 Y353 Y3 Y2 Y1
CP3A CP3B CP4A CP4B CP5A CP5B
FP9003 16 17 10 13 14 7 20 15 18 3 2 1 33 32 31 35 22 23 24 25 26 27 28 29 37 36 21 34 11 8 9 4 5 12
D2.9V
CL9065
CL9052
CL9049
CL9050

IC9101
(SYSTEM IC)
SO
SI
SCLK
SIOUT
SCLK OUT

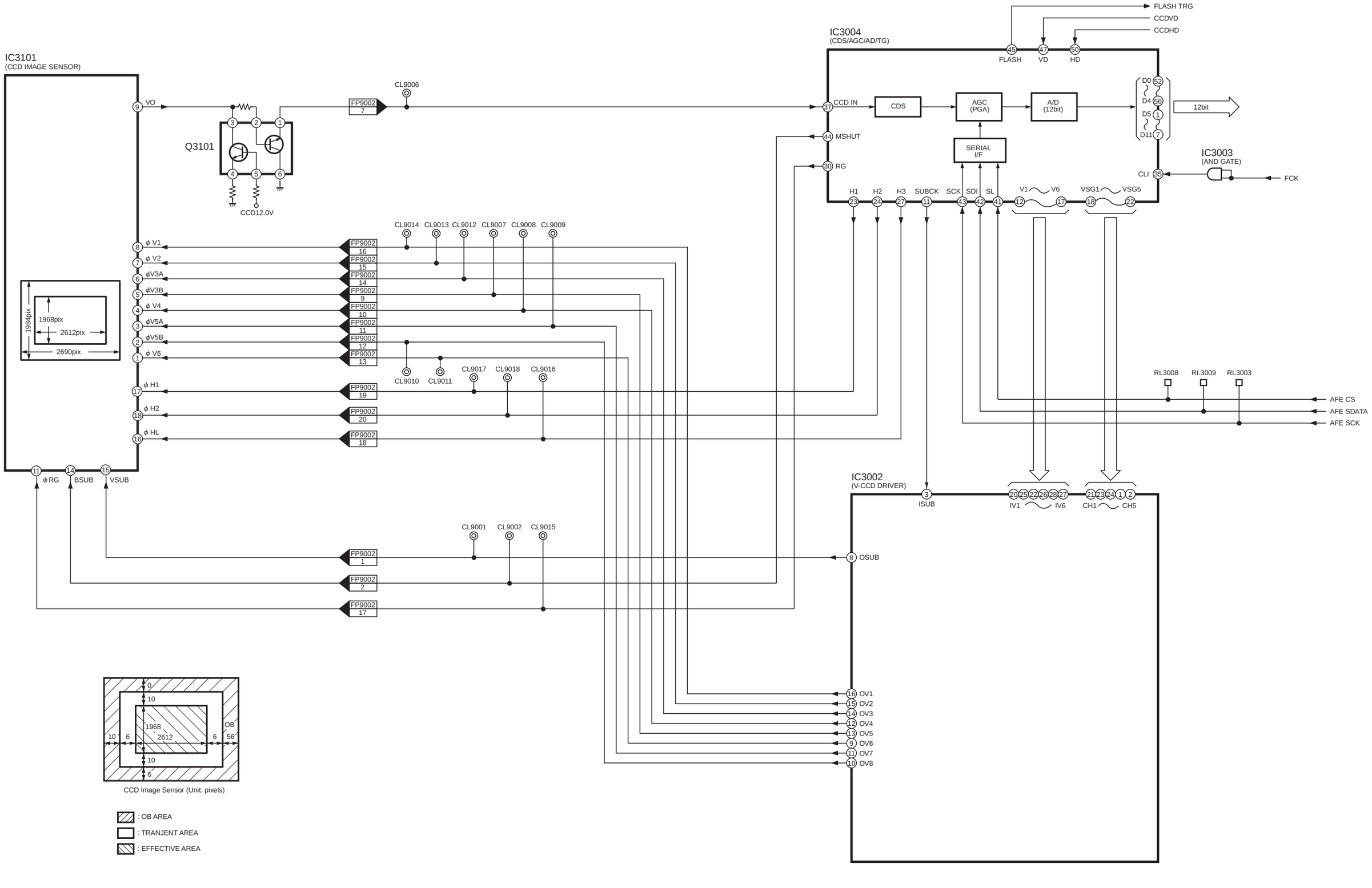
IC2001
(VIDEO AMP)
LPF
CL2002

JK2001
(DIGITAL / V OUT TERMINAL)

| | |
|---|---|
| VIDEO OUT | 2 |
| USB+ | 5 |
| USB CAB IN | 8 |
| USB- | 7 |

D2.9V
CL2006
QR2001
CL2008
CL2007

# SENSOR BLOCK DIAGRAM



# LENS DRIVE BLOCK DIAGRAM

CO. BARREL & FOCUS ENC
ZOOM ENC
FILTER
CCD
FP9001
Z1 ENC Vcc
FENC Vcc
FLED CNT
FABS
D2.9V
CL9020
CL9032
CL9031
Z1 LED CNT
Z2 LED CNT
Z1 ABS
Z2 ABS
CL9021
CL9023
CL9022
CL9024
QR7102
IC6001
(VENUS PLUS)
FZHP
FZHP LEDCNT
ZENC LEDCNT
ZENC1
ZENC2
MCK48I
MCK48O
X6001
(48MHz)
IC7001
(LENS MOTOR DRIVE)
CL9046
CL9045
CL9048
CL9047
FOCUS MOTOR
IRIS(ND) MOTOR
SHUTTER MOTOR
ZOOM MOTOR
BMP
BMN
AMP
AMN
CMP
CMN
DMP
DMN
MP
MN
BTL POWER AMP(B ch)
BTL POWER AMP(A ch)
BTL POWER AMP(C ch)
H-BRIDGE CONSTANT CURRENT DRIVER
CL9027
CL9030
CL9028
CL9029
CL9026
CL9025
DAC
LOGIC
RL7008
RL7009
RL7010
RL7011
EA
EB
EC
ED
STB
PWM FA
PWM FB
PWM IRIS
PWM SHUT
LEN STDBY
CK
DI
LD
SYSCK
RL7003
RL7013
RL7004
RL7002
X7001
(27MHz)
XPWM
RL7001
YPWM
DAC CK
DAC DI
DAC LD
PWM XOIS
PWM YOIS
REF
REFO
REFI
MREF
XDA
YDA
XFIL
YFIL
XMN
XMP
YMN
YMP
BTL POWER AMP(X/Y ch)
BTL POWER AMP(X ch)
BTL POWER AMP(Y ch)
ADC
XINP
XINN
YINP
YINN
HALL AMP
XVP
XVN
YVP
YVN
HALL ELEMENT
XPOS
YPOS
XDR AD
YDR AD
LENS UNIT
OIS UNIT
HALL SENSOR
XDR-
XDR+
XHO+
XHO-
XV+
XV-
YDR-
YDR+
YV+
YV-
YHO+
YHO-
IC7102
(GYRO X)
IC7103
(GYRO AMP)
IC7101
(GYRO Y)
OUT
VREF
GYRO X
GYRO Y
GYRO SW
Q7101
CL9098
CL9207
S9203
ZOOM CONTROL SW
PP9001
PS9201
1-3,18-20
17
16
T
W
TELE
WIDE
CL9214
CL9213
T8001
UNREG
C8003
(For Flash Charge)
CL8017
TL8003
TL8001
L8001
TL8002
FLASH
IC9101
(SYSTEM IC)
RL9103
RL9104
PWM IN
PWMOUT
STB PWM
Q8009
CL8009
STB CHG LV
IC3004
(CDS/AGC/AD/TG)
FLASH
FLASH TRG
IC8001
(ST TRG AMP)
5.0V
Q8001
CL8005